Industrial Arts and Vocational Education

January, 1953 Vol. 42, No. 1

SEASON'S GREETINGS

The Power Within

• All the material gains that are special to this age such as nuclear fission, electronics and coal chemistry have been achieved by looking deep within the constitution of matter.

So too with mankind, and it *does* matter who does the looking. Only as each sole man learns to look deep within himself, past mere pleasure and overweening pride, can he gain any notion of his true power, his true capabilities. And if he looks long enough he may even find within himself the answer to the vicious fears, dangers, vauntings and corruption that so characterize this moment of our civilization.

How get each person, especially each youngster who is now on his way to manhood, to look and to find the power? Certainly someone has to set the example, some older person, someone who has looked within and who makes a profession of so looking . . . the educator of our times.

The instructor in mechanical drafting is qualified on two counts. He knows the inner source of ideas, and he teaches in a field that puts a premium on such creative work, the values of which field are found only in man's inner core . . . the field of the engineer, the scientist and the creative craftsman. And so such instructor leads with care, stressing the world of inner values, of ambition, eagerness, zeal, achievement, discovery. Thus he leads the way up and he does not ever turn aside and undermine all he teaches by saying it does not matter what the quality of the tools the students use in their work.

Indeed these matter most of all for they are touchstones emanating cheapness or goodness according to how they are made. They are the coalescent point between the now and the hereafter. How then can they be less than fine, the maximum the student can afford?

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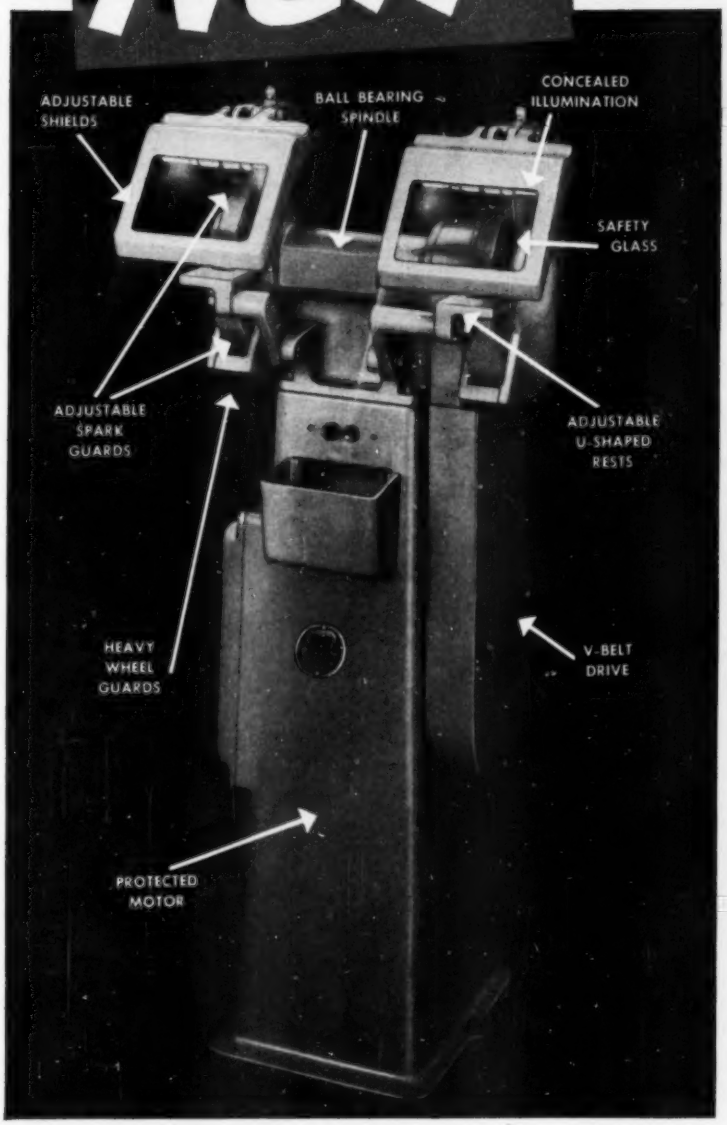

School shops will find this new industrial grinder ideal for student use. It is ruggedly built throughout to withstand hard service. The motor is enclosed in the pedestal and drives through a V-belt which removes the load and weight of the grinding wheels from the motor bearings, practically eliminates vibration and isolates the motor from abrasive dust.

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Spindle: Approximate speed 2450 r.p.m. Sealed ball bearings.

Motor: Standard 2875 r.p.m. 50 cycle or 3450 r.p.m. 60 cycle, also D.C.

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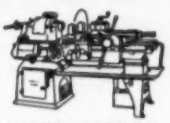
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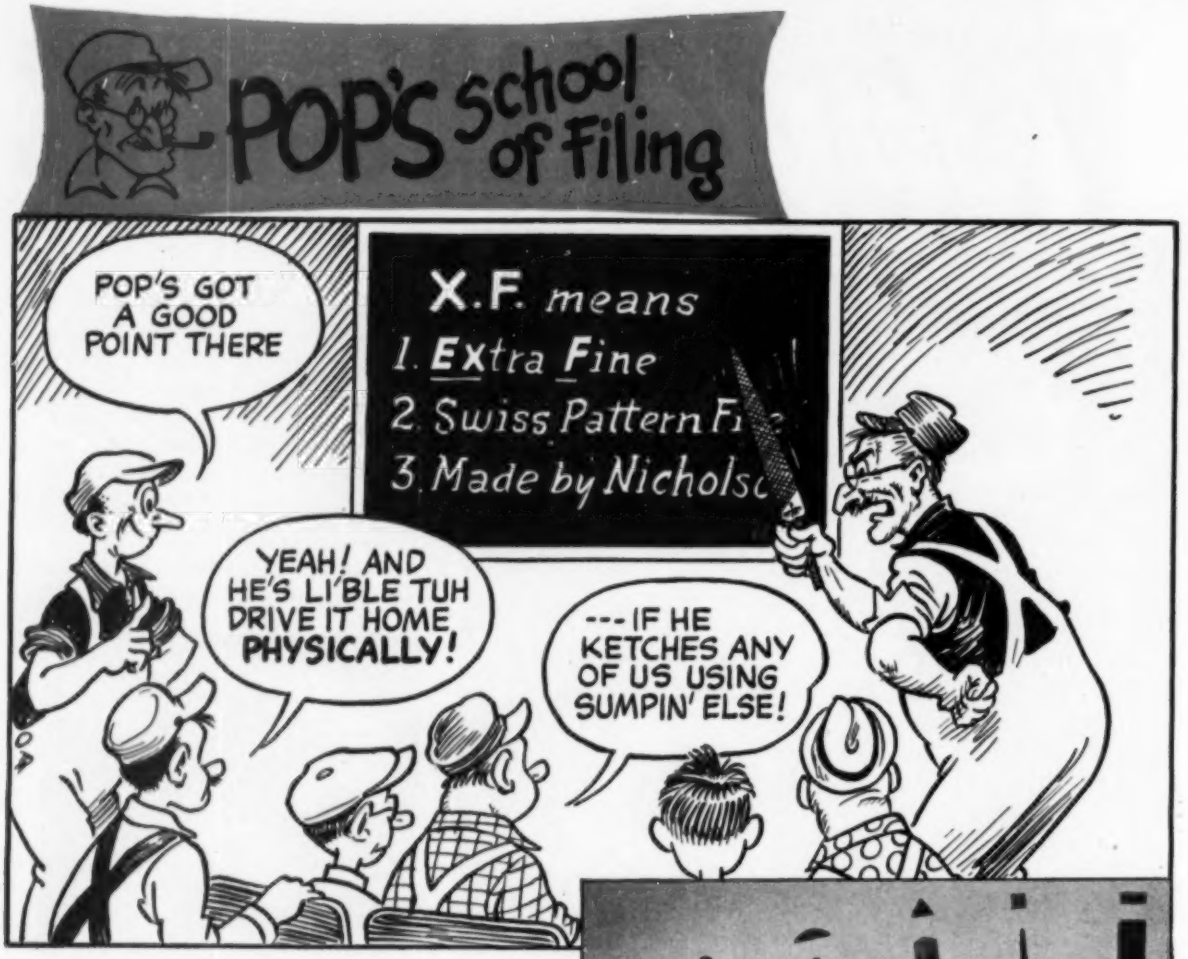
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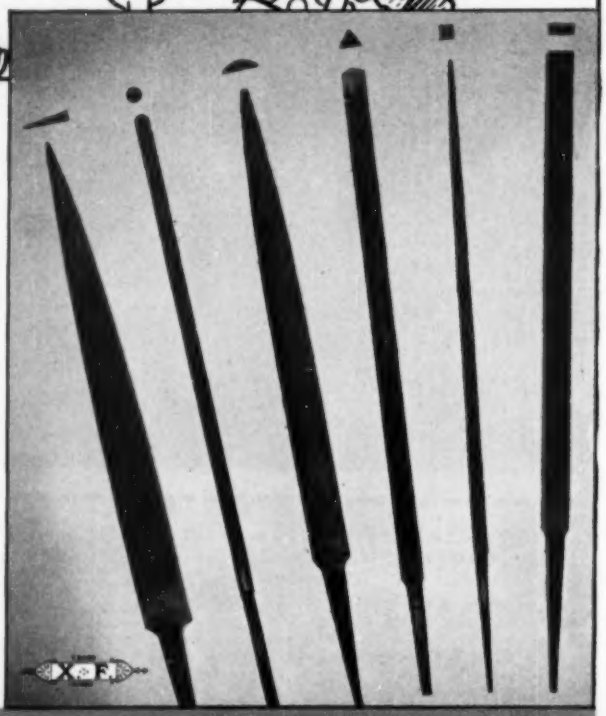

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Vol. 42 No. 1

JANUARY, 1953

INDUSTRIAL ARTS *and* VOCATIONAL EDUCATION

THE SHOP TEACHERS' PROFESSIONAL MAGAZINE

Published on the 15th of month preceding date of issue

THE BRUCE PUBLISHING COMPANY, 400 North Broadway, Milwaukee 1, Wis. • CENTRAL OFFICE: 20 North Wacker Drive, Chicago 6, Ill. • EASTERN OFFICE: 225 Broadway, New York 7, N. Y.

★ ★ ★

This Month's Cover

The picture used on the January, 1953, cover of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION shows a group of advanced drafting students watching one of their fellows solve a descriptive geometry problem.

The photograph was taken by Frederick Neuschel, Jr., drafting instructor at the High School, North Tonawanda, N. Y.

★ ★ ★

★ ★ ★

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Association News

39TH ANNUAL INDUSTRIAL ARTS CONFERENCE

At 9:30 a.m., on November 13, 1952, Dr. Verne C. Fryklund, president of The Stout Institute, Menomonie, Wis., opened the 39th anpual meeting of the Industrial Arts Conference at Hotel LaSalle, Chicago, Ill.

Chairman of the morning conference was Dr. H. H. London, University of Missouri, Columbia, Mo. He was assisted by E. R. Glazener, Arkansas A. & M. College, and Chris H. Groneman, Texas A. & M. College.

The subject discussed at this session was "Implications of the Industrial Arts Awards Program for Improving Instruction in Industrial Arts."

As the first speaker, Dr. London presented 14 questions to probe the effect of the awards program in realizing the industrial-arts objectives, the effect on project design, the effect on industrial-arts teachers, and on the education of the student, and whether the program was helping or hindering the industrial-arts program in our schools.

E. R. Glazener presented the result of a questionnaire which he had sent out to 36 teachers in 16 states to ascertain whether the program had improved the teaching of industrial arts and motivated teachers to lay greater emphasis to details of instruction. Also to find out why the number of entries in 1952 had increased 113 per cent over 1951. In each case, a majority of the teachers who answered were quite jubilant about what the program had achieved up to now.

Dr. Groneman spoke about the history of the movement and pointed out the efforts made by the Ford Company to improve industrial-arts programs in school, and how to make the judging of the projects more objective.

Dewey Barich of the Ford Company showed pictures of some of the 1952 prize-winning projects. He emphasized the fact that the students relished especially that they had a freedom of choice and that this challenge to the boy also became a challenge to the teacher.

Dr. Homer J. Smith was the general chairman at the Thursday afternoon meeting.

The subject for discussion for this session was "Technical and Professional Competence of Industrial Arts Teachers."

Mr. Barich acted as discussion chairman. He pointed out the general import of what was meant by technical and professional competence, after which Chas. R. Kinison, Ohio University, Athens, Ohio, explained the basic assumptions covered by these terms, and outlined the fields or areas generally understood to be covered in industrial arts and teacher training courses.

H. A. Pederson, State College, Platteville, Wis., presented a fine list of the professional competencies an industrial-arts teacher should possess at the time of receiving his bachelor's degree. These competencies embraced a knowledge of subject matter, skill in selecting, organizing, and teaching this subject matter; ability to plan, organize, and manage shops; do simple research; make and use instructional aids; promote industrial arts; co-operate with other members of the faculty; and know sources of materials, books, and the like. A spirited discussion followed.

A. B. Mays was the general chairman at the Friday morning session. The reporting committee consisted of chairman Dr. G. H. Silvius, Wayne University, Detroit, Mich.; Dr. W. C. Bicknell,

(Continued on page 6A)

Industrial Arts Awards Program Advisory Committee

Left to right around the table are John Ellis, Industrial Arts Awards staff member; Verne L. Pickens, head of industrial arts of the Kansas City, Mo., schools; Thomas Diamond, chairman of the editorial board, School Shop Magazine, Ann Arbor, Mich.; Heber A. Sotzin, head of industrial arts education, San Jose State College, San Jose, Calif.; Dewey Barich, manager, educational services, Ford Motor Company; DeWitt Hunt, head of industrial arts education, Oklahoma A. and M. College, Stillwater, Okla., James J. Hammond, director of industrial arts, State Teachers College, Fitchburg, Mass.; Walter R. Williams, Jr., head of industrial arts, University of Florida, Gainesville, Fla.; Frank C. Moore, director of industrial arts, Board of Education, Cleveland, Ohio; and Roy G. Fales, chief of the bureau of industrial arts education, State Education Department, Albany, N. Y.

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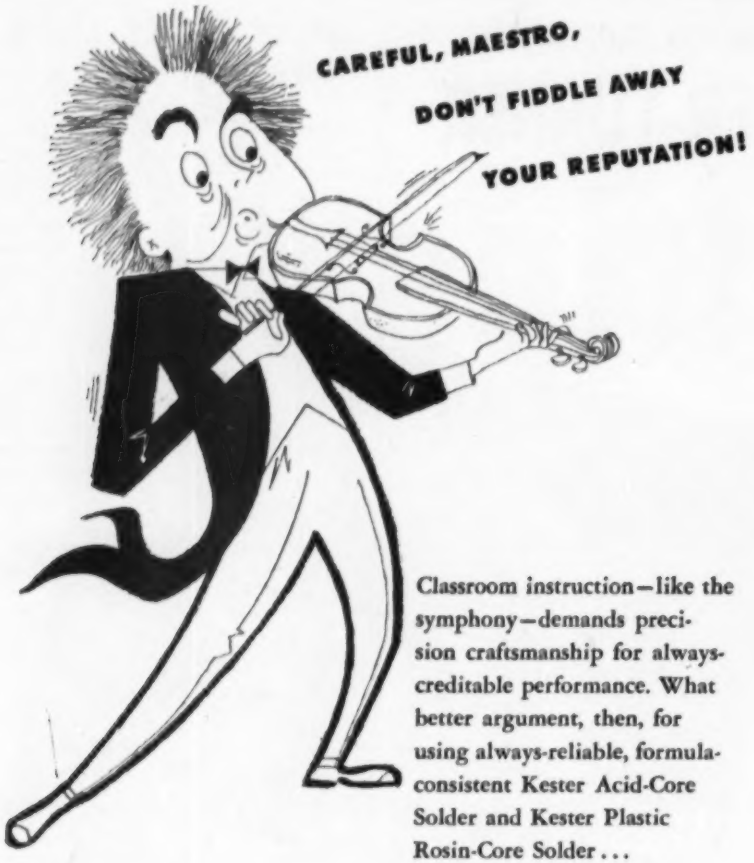

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ASSOCIATION NEWS

(Continued from page 4A)

Southern Illinois University, Carbondale, Ill.; and Harry Jackson, State Teachers College, Winona, Minn.

"Selected Doctoral Research in Industrial Arts Education" was the subject chosen for the discussion.

The committee had invited Roderick G. Kohler, Northern Illinois State Teachers College, DeKalb, Ill., to present and discuss a study that he had made entitled "Status and Trends in Graduate Industrial Teacher Education." This encompassed a survey of how such graduate programs are organized and administered; what prerequisites for graduate study are required; the graduate credit requirement for degrees; the qualifications of staff in institutions offering graduate degrees; and the course offerings of different institutions.

The second study was presented by Beryl M. Cunningham, Bradley University, Peoria, Ill. Dr. Cunningham's thesis was on "Maintenance of Wood Shop Equipment," and he explained how he gathered his information from manufacturers' booklets and catalogs in the absence of texts on this subject.

Raymond H. Larson then explained his study on "Success Patterns in Industrial Education," which screened the findings obtained from 237 first degree, and 166 second degree graduates in industrial education at the University of Minnesota.

Dr. W. T. Bawden, unfortunately, could not attend to act as chairman of the afternoon session. John J. Metz, editor of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine, Milwaukee, Wis., was, therefore, appointed to take his place.

The subject for discussion was "Implications of Teacher Education for the Dual Function of Teaching Industrial Arts and Trades and Industries."

Dr. Ralph Wenrich, University of Michigan, Ann Arbor, Mich., headed the committee which was to present this subject. He was ably assisted by Dr. M. F. Poyzer, University of North Dakota, Grand Forks, N. Dak., and R. M. Stombaugh, State Normal University, Normal, Ill.

Mr. Stombaugh presented a paper in favor of preparing teachers who could qualify both as teachers of industrial arts and of vocational education, because institutions doing this would thus have drawing powers on students desiring to enter both fields.

M. F. Poyzer emphasized the fact that there are definite differences in the two fields in the method of teaching, equipment used, materials employed, and the projects produced.

Dr. Wenrich felt that the institutions should be in position to prepare students according to students' needs and interests, and pointed out that frequently the same teachers have to take care of industrial-arts classes as well as industrial-vocational classes.

On Saturday morning, Milo Oakland, State Teachers College, DeKalb, Ill., was chairman of the committee which presented the topic "Shopwork for Graduate Credit." He was assisted by S. M. Dell, McPherson College, McPherson, Kans., and R. M. Torgerson, State University, Bowling Green, Ohio.

Mr. Torgerson stated that many offer shopwork in their graduate courses, but insist that it be given a research laboratory type of experience.

Mr. Dell held the same view, and said that

(Continued on page 10A)

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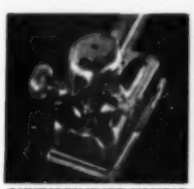

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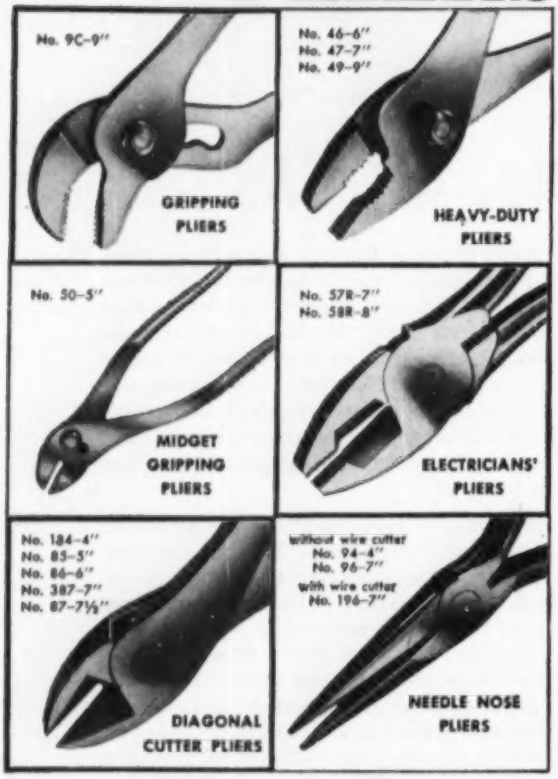

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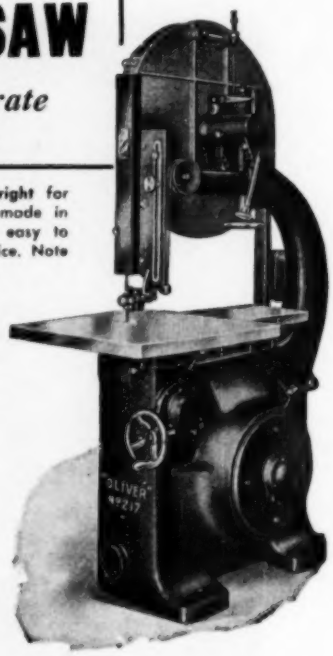

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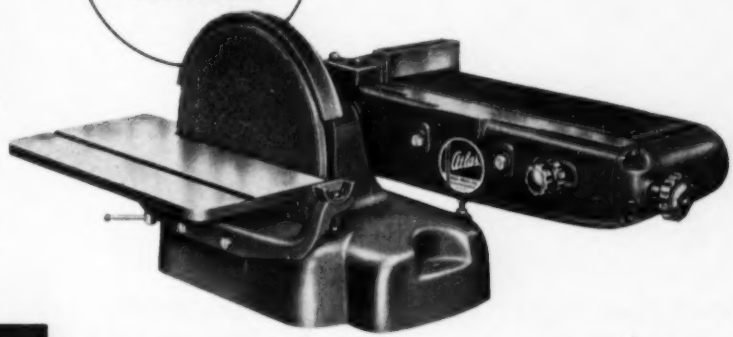

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ASSOCIATION NEWS

(Continued from page 6A)

the graduate shopwork usually consisted of larger assignments and more work for the student.

Mr. Oakland pointed out that it was done in other fields such as engineering, the sciences, medicine, etc., and that probably similar programs could be worked out for students in the fields of industrial arts and vocational education.

At the business session the following were admitted to membership: Dr. Otto L. Barnett, Missouri State Teachers College, Kirksville, Mo.; Dr. O. A. Hankammer, Kansas State Teachers College, Pittsburg, Kans.; Dr. Ray Karnes, University of Illinois, Urbana, Ill.; and Dr. E. W. Tischendorf, Kent State Teachers College, Kent, Ohio.

The next conference will be held November 12 to 14, 1953, at the LaSalle Hotel, Chicago, Ill.

EPSILON PI TAU BREAKFAST

The annual Epsilon Pi Tau breakfast meeting conducted annually in connection with the Wisconsin Education Association, was held in Milwaukee, Wis., at 7:00 a.m., on Friday, November 7.

This meeting was specially arranged to honor Dean Clyde A. Bowman, who is retiring from The Stout Institute, Menomonie, Wis., at the end of the present semester.

A cash donation was tendered him as a mark of appreciation and gratitude for his 33 years of service at the Stout Institute.

Harold A. Schultz and Kenneth Pederson deserve great credit for the fine program which they had arranged for this breakfast.

About 40 members attended.

WISCONSIN INDUSTRIAL ARTS ASSOCIATION MEETING

The annual meeting of the Wisconsin Industrial Arts Association was held in Milwaukee on November 6, 1952. President H. A. Pederson, Wisconsin State College, Plattevil'e, presided. Approximately 300 were in attendance.

Guest Speaker Dr. S. J. Pawelek, supervisor of industrial education, Baltimore, Md., titled his talk "Whither Are We Bound."

Dean Clyde A. Bowman, The Stout Institute Menomonie, Wis., who recently announced plans for retirement effective at the end of the first semester, was presented with an Honorary Life Membership in the Wisconsin Industrial Arts Association.

H. J. Shufelt, Racine, retiring secretary-treasurer, was presented with a service award letter in recognition of his 16 years as a member of the Wisconsin Industrial Arts Association executive committee and 12 years as secretary-treasurer.

Kenneth Schank, Racine, gave a report on insurance plans for liability coverage of school shop accidents.

The executive committee was instructed to appoint a committee to study the problem of liability and investigate insurance plans for liability coverage.

Vice-president R. A. Wigen reported on the progress of the continuously functioning statewide industrial arts curriculum committee.

Clyde A. Bowman gave a report on the Industrial Arts Awards program.

Industrial arts group meetings on woodworking, graphic arts, general shop, mechanical drawing, and general metal and machine shop, were held Friday afternoon.

Officers elected were: president: R. A. Wigen, The Stout Institute, Menomonie; vice-president: Leo Jenkins, LaCrosse; secretary-treasurer: Leo R. Ebben, Kohler; committeeman: Fred Darling, Beloit.

Retiring president H. A. Pederson was presented with a past president's pin — a practice inaugurated for the first time this year.

SOUTH DAKOTA INDUSTRIAL EDUCATION ASSOCIATION

Members of the South Dakota Industrial Education Association met during the state convention of the South Dakota Education Association at Sioux Falls, S. D., October 19–22.

On Monday morning several groups visited leading Sioux Falls industries. At the luncheon on Monday noon the members were addressed by John A. Butler, assistant director of Dunwoody Institute.

On Tuesday, several demonstrations on shop activities were presented in the Washington High School Shops, followed by a showing of the Ford Foundation film of Industrial Arts Awards.

The business meeting concluded the activities. A constitution for the newly organized group was adopted. Officers elected for the next biennium: president, Roy Sterrett, Rapid City; vice-president, M. F. Hack, Madison; secretary-treasurer, Warren Messman, Aberdeen.

(Continued on page 20A)

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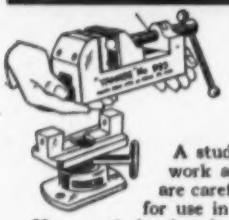

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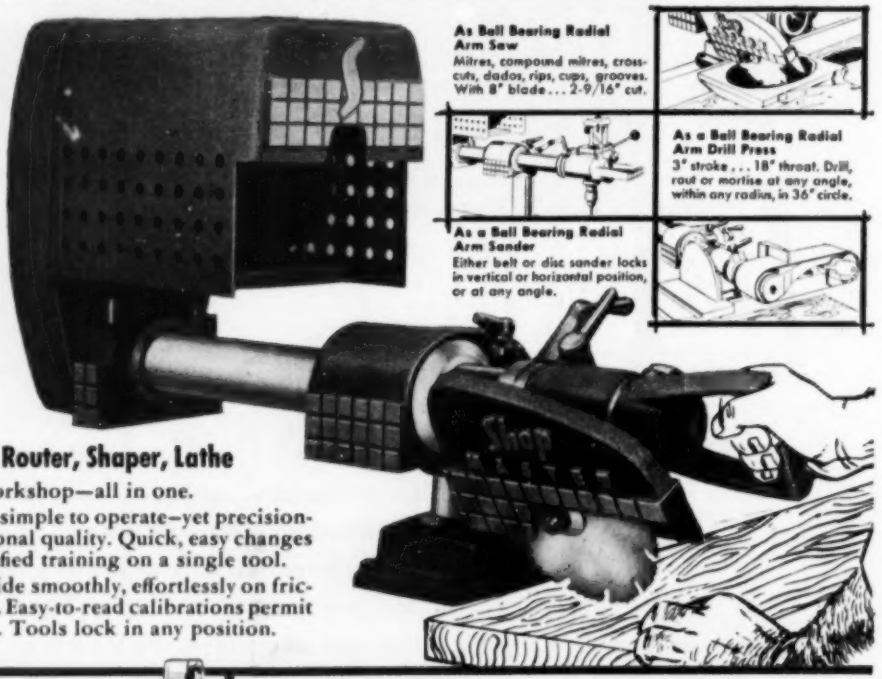

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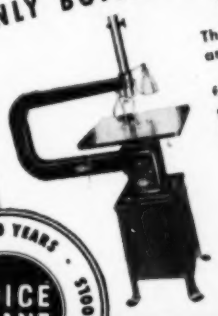

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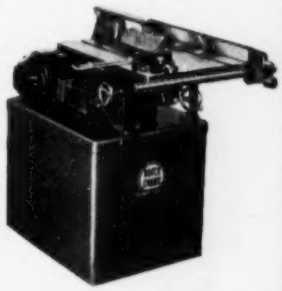

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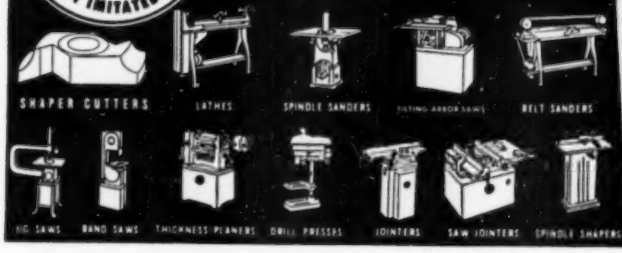

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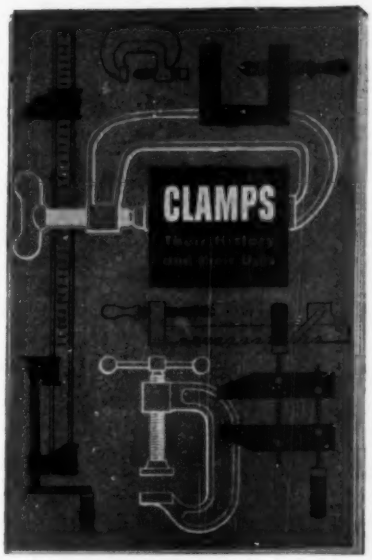

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INDUSTRIAL ARTS *and* VOCATIONAL EDUCATION

JANUARY 1953

Human Relations and Improved Learning

NELSON A. HAUER
Head, Department of Industrial Education
Louisiana State University
Baton Rouge, La.

The field of human relations has been receiving increased attention by many who are concerned with the task of managing people and who are interested in helping people to make a more satisfactory adjustment to their particular social situation whether at work or at play.

A number of universities, colleges, and research centers are directing their attention to the problems confronting people in making their adjustment to the group with which they associate. Industry, management, and labor, likewise, are interested in the human relations of employees, for it is realized that the happy employee is a more efficient worker.

School Shops Versus Industrial Shops

The employee in industry has been helped by improved human relationships. Close attention to the problems of human relations by the instructor of the school shop should prove equally beneficial to the student. The vocational-industrial and industrial-arts shops in many respects are not unlike the shops in industry and they have many things in common. For example, the machinery, equipment, and materials are similar. The general nature of activity of the worker in industry and the student in the school shop are similar because both have a task to perform, such as a job, project, or assignment to complete. While performing their tasks, both the employee and the student associate with fellow workers or students as members of a group. The actions of both groups are strongly influenced by their emotional stability. An employee thoroughly adjusted to his work situation is a better producer than one who is discontented or upset. A happy student is a better learner than one who is emotionally disturbed and whose thoughts are on other things rather than his studies. The big difference between a school shop and a shop in industry is that the emphasis in school is upon learning, while in industry it is upon production.

Factors Affecting Learning

Most students have greater potential ability than they use. Lack of interest, dislike of school, poor study habits, out of school activities, unhappy home life, all contribute to emotional disturbances which prevent students from doing their best work in school. Part of the teacher's job is to create a class atmosphere which is highly conducive to learning as a means for encouraging students to put forth their greatest efforts.

Emotional Tone of Class. When students have a feeling of belonging, freedom to express their opinions, ask questions, and are treated as young adults in a democratic society, the emotional tone is favorable for learning. Some shops are happy and enjoyable to work in; others are dull and disagreeable with a number of students avoiding the teacher and shunning studies at every opportunity.

In a shop where the emotional tone is satisfactory, students enjoy being with each other. In an unsatisfactory situation students are more likely to consider school a form of drudgery and to be anxious to get away as soon as possible. Much of the difference between a satisfactory and an unsatisfactory situation lies in the way the instructor establishes the emotional tone for human relationships, and the manner in which he works with the students.

A satisfying emotional tone very often is created by respecting the individuality of the students. Respect for students has many manifestations. It relates to being interested in students personally and in their problems, giving consideration to their ideas and suggestions, recognizing efforts and achievement, maintaining an even disposition, and showing courtesy at all times. Closely associated with emotional satisfaction is student morale.

Student Morale. The interest and achievement of students in learning is strongly influenced by the level of their morale. It may be high or low. A high state of morale is indicative of zeal, spirit, hope, and confidence. A low state of morale portrays futility and a feeling of hopelessness.

Although morale is something intangible, the quality may be determined by carefully observing the students. Eagerness to learn, enthusiasm, co-operativeness, and

satisfactory standards of achievement indicate a high level of student morale. Excessive absences, tardiness, poor discipline, complaints, and poorly prepared lessons reflect low morale.

High morale stimulates learning, low morale retards learning. Students with a low level of morale do not learn according to their potential ability. High morale is built by satisfying the needs of students and teaching from a course of study that relates to their individual goals and expectations.

Student Likes and Dislikes

In an effort to determine factors which cause discontent or dissatisfaction in a school shop, a study was made of 250 high school students. They were asked to describe the traits they liked or disliked most about teachers. The replies were submitted unsigned. Although the method may have weaknesses, the replies made interesting reading. For purposes of identification, the replies were classified into groups. The basis for the classification was suggested by the nature of the responses, rather than by a predetermined method. Students' likes were classified into two groups and dislikes into three groups. The following statements are representative of actual responses.

TRAITS STUDENTS LIKE ABOUT A TEACHER

I. *Personality*
1. Gives a good first impression
2. Has neat appearance
3. Has good poise and posture
4. Has well-pitched voice
5. Speaks with a speed regulated to a learning situation
6. Uses words and phrases in keeping with the lesson
7. Shows humor occasionally
8. Has an interest in the course
9. Respects students
10. Is open-minded
11. Is frank and honest
12. Has sense of responsibility
13. Has wide scope of interest

II. *Methods of Teaching*
1. Knows his subject and how to teach it
2. Explains subject matter clearly
3. Stresses important facts
4. Varies method of presentation to suit the subject matter
5. Supplements presentations with examples, illustrations, and visual aids
6. Supports his arguments with facts
7. Distributes work study load evenly throughout the term
8. Reviews before and after tests
9. Keeps within class time limits

STUDENTS' DISLIKES ABOUT TEACHERS

I. *Personality Traits*
1. Lacks an open mind
2. Has superior attitude
3. Possesses nervous habits
4. Has untidy appearance
5. Reflects a pessimistic attitude toward life

II. *Teacher-Student Relations*
1. Lacks understanding of human relations
2. Shows favoritism
3. Uses undue familiarity
4. Shows no interest in students
5. Shows lack of respect for students' efforts, even though sincere

III. *Methods of Teaching*
1. Gives uninteresting lectures
2. Talks too rapidly when lecturing
3. Presents lectures too general and with vague objectives
4. Presents subject in a poorly organized form
5. Course lacks definite direction
6. Teaches "off the cuff"
7. Lacks interest in course
8. Creates in the minds of the students a fear of asking questions
9. Can't teach on the students' level
10. Can't explain what he actually knows
11. Teacher reflects limited experience
12. Examples and illustrations not within the range of knowledge and appreciation of the class
13. Presents a theory but can't support it
14. Gives Pop quizzes
15. Poorly phrased questions on examinations
16. Use of poor tests
17. Teacher confuses rote memory with the development of mental ability

Teacher-Student Human Relations Factors

There are a number of reasons for the frustrations and anxieties of students today, many of which are not caused by conditions in the school. Many students today are showing the effects brought about by World War II. They are victims of unsettled home life. Often the parents were separated with the father in the service. In many instances the mother worked while the child spent a great deal of his young life in a nursery or under the care of a baby sitter. Of greater concern is the fact that the students in school today do not know what it is to attend under normal peace time conditions. Whatever the teacher can do to relieve mental and emotional stresses should be considered part of the job of teaching. The following checklist of fifty statements is suggested for teacher self-evaluation in building up better human relations and improved learning in the school shop.

Teacher-Student Human Relation Factors

1. Do you give new students in your department your close attention promptly so that they develop a feeling of belonging?

2. Do you try to get and keep the confidence and respect of those you teach?

3. Do your actions indicate that you have confidence in your students?

4. Do you keep your promises to students, and are you dependable?

5. Do you show an interest in students personally as well as in their work?

6. Do you treat students fairly, showing no favoritism?

7. Do you provide for and encourage a clear two-way channel of communication between students and teacher?

8. Do you conduct open general discussions occasionally just to talk things over and let students air their views?

9. Do you practice the principles of good teacher-student and student-student relations?

10. Do you keep students informed on all matters pertaining to school and class policies?

11. Do you insure that class and school regulations are made known in terms of the reasoning supporting them so that the students will understand and appreciate their meaning?

12. Do you make students feel that they are members of society rather than just immature individuals going to school?

13. Do you point out the student's importance as a contributing and active member of society?

Shop and Classroom Procedures

14. Do you follow a well-organized plan of instruction that meets the needs of your students?

15. Do you anticipate your instructional needs allowing time to make satisfactory preparations?

16. Do you follow an organized procedure in acquainting new students with the general objectives and an overview of your course?

17. Do you inform students of the purpose of the course and how it fits into the total educational program or curriculum in respect to student goals?

18. Do you inform your students of what is expected of them and how to achieve the most out of the course?

19. Do you give the students a complete understanding of the work they are to perform and how they are to perform it?

20. Do you follow a definite program for developing the student's mental, physical, and emotional behavior?

21. Do you give students responsibility to develop confidence and character?

22. Do you provide an opportunity and encourage students to show initiative?

23. Do you make every effort to provide learning situations to develop the total student?

24. Do you make it a point in the shop or laboratory to supervise students closely, especially during the first few days in the beginning of the semester to insure that they get started correctly and that they develop a sound basic understanding of the work?

25. Do you give sufficient supervision to students performing their assignments to insure maximum learning and minimum loss of time?

26. Do you encourage students to progress to more and more difficult and advanced work?

27. Do you stimulate a desire to learn and to have pride in accomplishment?

28. Do you give students the training and guidance necessary for their advancement?

29. Do you see that more advanced students are assigned tasks that appeal to their interest and challenge their ability?

30. Do you keep a check on students to determine whether the progress you expected as to quality and quantity is being accomplished?

31. Do you conduct your classes in a manner to stimulate maximum student activity and learning?

32. Do you offer students remedial instruction and constructive criticism of their weaknesses or faulty practices?

33. Do you give criticism of students' efforts in a manner that results in recognition of their faults without losing respect for your program of instruction and good intentions?

34. Do you reject the work of students in such a manner that you retain their respect and interest in your course?

35. Do you allow students to explain possible reasons for their mistakes as a basis for remedial instruction?

36. Do you keep students informed as to their progress and give them credit for exceptional work, good judgment, and originality?

37. Do you give assignments and instructions clearly and completely so as to avoid misunderstanding?

38. Do you give assignments that appeal to the interest of the students and compensate them for their time and effort?

39. Do you conduct your classes in such a manner that the attitude of the students reflects satisfaction with your course and instructions?

40. Do you evaluate your methods of teaching as a means for improving the quality of the instruction and insuring better learning?

41. Do you give exit interviews or provide for a terminal conference at the end of the term to determine the extent to which students were satisfied or dissatisfied with your course?

Guidance Factors

42. Do you provide time for individual counseling and follow-up with students in need of assistance?

43. Do you adhere to the "open door" policy so that students may come to you for advice and information?

44. Do you encourage students to make suggestions regarding their personal interests and problems?

45. Do you give prompt attention to students having complexes, personal difficulties, whether real or imaginary?

46. Do you discuss first delinquencies with students to prevent their becoming chronic?

47. Do you make every effort, in counseling students, to get all the facts and to understand the student's viewpoint before making decisions?

48. Do you make it a point in counseling never to send a student away feeling discouraged and hopeless?

49. Do you keep a record of students' needs for remedial instruction?

50. Do you keep sufficient records of students to write letters of recommendations upon request, and to assist students in getting desirable positions?

Purpose and Utilization of Advisory Committees

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At the close of a series of school advisory committees it was suggested that it would be helpful if a brief statement could be prepared, outlining the purpose, value, and utilization of an advisory committee. The request indicated it would be valuable if the agenda for the initial or first meeting of a school advisory committee could also be outlined; also what topics would be desirable for the second and succeeding yearly committee meetings.

The following outline was therefore developed. The conference method was used; the members of the conference group were persons who had attended several initial advisory committee meetings and who now have the responsibility of planning the yearly meetings.

Purpose of Advisory Committees

The purpose and utilization (by school administrators and curriculum advisers) of advisory committees:

1. To explore possible training needs for which a school should provide training opportunities.
2. To advise the school on matters of course outline, content, equipment, space, production work, employment conditions.
3. To suggest job titles, classifications, and duties.
4. To make recommendations on basis of exploration of training opportunities.
5. Assist in employment placement plans.

Value of Advisory Committees

1. Good public relations: (*a*) Industry gets a clear understanding of the school and its functions. (*b*) Instructor secures closer tie-up to industry. (*c*) Access to plants is secured.
2. Keeps course outline up to date as data is supplied for curriculum revision.
3. Provides tangible evidence that industry is supporting the program.
4. Assists in providing accurate job information and placement opportunities.
5. Assists instructor in securing "live" projects with committee approval.
6. Sometimes new equipment is made available to the school.
7. Sometimes selected students are recruited for a class.
8. Committee members also profit by interchange of ideas pertinent to their industry or allied occupation.
9. Sometimes aid in placing trainees.

Initial Assistance of an Advisory Committee (First Meeting)

1. *Exploratory*
   - *a*) Discussion of need for a course
   - *b*) Discussion of type of course
     - 1) Preparatory
     - 2) Extension
     - 3) Co-operative

     Content of a course outline based on industrial needs and experience.
2. *Advise*
   - *a*) On the job classifications
   - *b*) On standards of accomplishment
   - *c*) Available instructors
   - *d*) How to get students
3. *Recommend*
   - *a*) Space requirements
   - *b*) Equipment and supplies required
   - *c*) Facilities (heat, light, power, and the like, also physical or plant facilities)
   - *d*) Instructional aids
4. *Basic questions*
   - *a*) What is a good definition which describes the worker?
   - *b*) What does the worker *do?* (manipulative work)

     This is an excellent question to start the discussion as committee members, if well selected, know the answer.
   - *c*) What must the worker *know* in order to *do?*

     This question provides the related technical instruction units which are usually taught in an evening class, if apprentices are involved.
   - *d*) Which units are the most important? The answer to this question indicates the *time spread* which should be allotted to each unit.
   - *e*) Which units should be taught first? This question determines teaching sequence.

Periodic Evaluations (Yearly)

Items to discuss at yearly meetings of the committee:

NOTE: (1) Some of these will not be used each time. (2) Some items may be limited to special types of classes.

1. Instructor's progress report — number of students, equipment, placement, course outline, visual aids
2. Evaluation of course content
3. Order of course topic presentation
4. Technological improvements which might affect the training program
5. Changes in techniques of doing
6. Changes in technical problems
7. Related instruction to be taught in other classes
8. "Live" project limitations
9. Types of programs: preparatory, apprenticeship, trade extension
10. Extension of the program
11. Additional equipment
12. Employment opportunities
13. Quality of student *on-the-job* performance
14. Need for trade test (applicable to apprenticeship)
15. Scholarships

Exhibit of work done by students

— Submitted by Arthur C. Wenzel, State Teachers College, California, Pa.

Administration and Teacher Responsibilities

— For utilizing or following committee recommendations

1. *Administration*
   - *a*) Act on committee recommendations within limits of budgets, facilities, class size, employment conditions, and the like.
   - *b*) Arrange to add new classes.
   - *c*) Provide requested new courses.
   - *d*) Send *thank you* notes to committee shortly after meeting is held.
   - *e*) Notify committee members by mail of progress made from time to time.
   - *f*) Work out mechanics for setting up the meeting.
   - *g*) Send out minutes as soon as possible.
   - *h*) Check contents of envelope: minutes, committee members, questions.

NOTE: The board of education and school administrators may not delegate authority or responsibility for the program, but should welcome advice of committee.

2. *Instructor*
   - *a*) Post course outline of curriculum in classroom.
   - *b*) Review minutes as soon as completed and set up a periodic evaluation schedule.
   - *c*) Adjust course outline where recommended.
   - *d*) Study the committee membership.
   - *e*) Make personal contacts with active and prospective committee members.
   - *f*) Review minutes prior to next meeting. Arrange for and hold a preview and set up the agenda.
   - *g*) Prepare a progress report for next meeting.
   - *h*) Check the mailing list.

How Appropriate Is a Project?

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and
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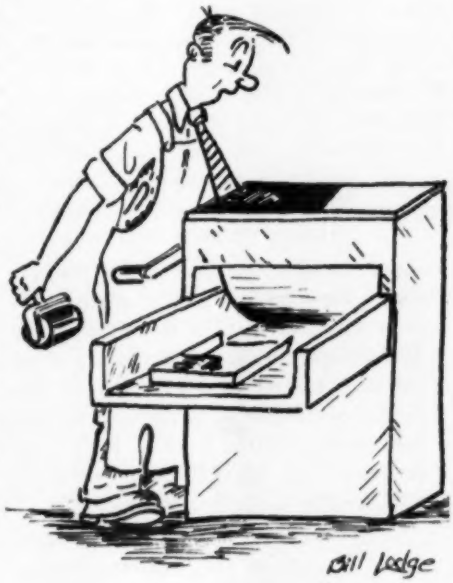
To the industrial-arts teacher a project is a vehicle through which instructional content is presented and other industrial-arts objectives attained. To most students it is the one reason he enrolled in the course; he wants to make some worthwhile project.

It is the responsibility of the teacher to select, or permit the student to select, a project which is appropriate. *Appropriate for what?* The question of appropriateness suggests that some criteria or list of factors must be considered to ascertain a project's appropriateness.

The project rating scale herein presented is an attempt to not only check a project's appropriateness against 16 factors, but to make possible by comparison of numerical values, the appropriateness of one project over another. While it is true that the rating is somewhat subjective, mere use of the rating scale will cause an instructor to give considerable thought to the appropriateness of a project.

Having rated the projects for an industrial-arts subject, the instructor will note that some factors are considered in every project; whereas, other factors are involved in some projects but not in others. It is important that all of the factors will have been given maximum consideration at some time during the term so as to fulfill the objectives of industrial arts.

The authors developed the project rating scale primarily for use by practice teachers of industrial-arts subjects; however, teachers in the field may find it useful as a guide to plan projects or as a check on the appropriateness of projects now being used.



I never did like that tie!
— B. E. Lodge, Tasley, Va.

A brief interpretation of each factor follows:

1. *Are new units of instruction introduced?* The primary purpose of the project is to provide a vehicle through which instruction is presented. If new learning units are not incorporated the project is not appropriate.

2. *Is some freedom of choice permitted?* It is desirable for students to have some voice in the selection of projects, especially beyond the first two or three, as this will add interest in making the project. On the beginning level, required projects are desirable because students do not have the ability to select and plan wisely. As they progress, students may be permitted to select from a number of planned projects. Advanced students should be encouraged to select and plan their own projects.

3. *Is it socially worth while?* It would not be advisable to plan a project or permit a student to plan a project which would encourage violation of moral standards in a community or school, e.g., an instructor may be encouraging 13-year-old boys to smoke if he requires them to make plastic cigarette cases, unless the project has been designated as a gift. Projects which may cause injury to oneself and others should be discouraged. Proj-

PROJECT RATING SCALE

To Ascertain Appropriateness of Project

Factors Based on Course Objectives and Individual Differences	*Exercise*	*Duck Call*	*Projects*
1. Are new units of instruction introduced?	3	3	
2. Is some freedom of choice permitted?	0	3	
3. Is it socially worthwhile?	0	3	
4. Does it involve student planning?	0	3	
5. Does it permit co-operative group work?	0	0	
6. Is complexity appropriate to progress level?	3	3	
7. Does it provide problem solving?	2	3	
8. Is it appropriate for students having certain physical handicaps?	3	3	
9. Are one or more of the following factors of design considered: *functional, aesthetic value, construction?*	0	3	
10. Are one or more of the following motivating interests involved:	0	3	
Athletic sports — Hunting and fishing			
Indoor games — Collecting			
Reading — Farm projects			
Gifts (for praise) — Home workshop			
Boy scout merit requirements			
Amateur pursuits (photography, etc.)			
Artistic work (carving, inlay, etc.)			
Others			
Physical Factors			
11. Will it fit school schedule? (Length of course and class period)	2	3	
12. Are facilities available?	2	2	
13. Are supplies available?	2	2	
14. Is cost within range of student's ability to pay?	2	2	
15. Is manipulative work hazardous for a given maturity level?	2	2	
16. Is it appropriate for the season?	0	2	
17. Is storage space available?	2	2	
Total	23	42	

Key to Numerical Values

Factors 1–10
- 3 — Maximum consideration
- 2 — Notable consideration
- 1 — Some consideration
- 0 — No consideration

Factors 11–17
- 2 — Maximum consideration
- 1 — Some consideration
- 0 — No consideration

ects which if used would violate game, fish, and fowl laws would not be appropriate.

4. ***Does it involve student planning?*** In all instances wherein the instructor plans a required project for the students, especially beginners, the importance of/and what planning means should be taught by having the student follow a well-made plan, and make him aware of its content and use. Advanced students should be given an opportunity to plan.

5. ***Does it permit co-operative group work?*** Perhaps but one or two projects during the term will involve group work. It is desirable to plan so students may work co-operatively on a project in about the same manner as industry would produce a product so as to acquaint the students with industrial practice. If the project does not involve group work, no consideration is given to this factor.

6. ***Is complexity appropriate to progress level?*** Projects on the beginning progress level should be simple, and not involve a great many operations. As students advance to higher progress levels, projects should become more complex.

7. ***Does it provide problem solving?*** Every project should provide some opportunity for the student to plan for some decision — simple or complex. Perhaps, the problem will be as simple as selecting two paint colors for his fishing plug which he turned on a lathe; or it may be as complex as arranging the grain pattern, color and direction of walnut stock prior to gluing up for a dining table top.

8. ***Is it appropriate for students having certain physical handicaps?*** Because of a physical handicap a student may not be able to perform certain operations in building the project, or his handicap may hinder him from using the project upon completion. In either case the project is not likely to be appropriate.

9. ***Are one or more of the following factors of design considered?*** A project should be useful; it should have a pleasing appearance, and it should be well constructed. It is likely that more emphasis will be placed on one factor than another, e.g., one would be more concerned about the sturdy construction of a workbench as compared to its appearance. Nevertheless, all three factors of design should be considered when ascertaining the appropriateness of a project.

10. ***Are one of the following motivating interests involved?*** Within the first paragraph of this article it was stated that most boys enroll for shop classes because they want to make some worth-while object. The instructor should make every attempt to permit the boys to make projects according to their interests. This is by far the best motivating device available to the instructor. Required and limited elective projects should be planned in interest areas common to the students of a community. Little or no consideration need be given the interest factor if the student selects and plans his own project; he will naturally select a project in which he is interested.

11. ***Will it fit school schedule?*** A project should be completed in a reasonable length of time. It is discouraging for a student to take a project home partially completed. For beginning students it may be wise to plan some projects that may be completed within four or five class meetings.

12. ***Are facilities available?*** By glancing through the procedure for making the

project, the instructor will determine whether or not he has the tools and equipment necessary. If he cannot change the plans and procedure to conform to facilities available, the project is not appropriate.

13. *Are supplies available?* By glancing at the bill of material the instructor may determine whether or not he has supplies in stock. In most instances if supplies are not in stock, they may be easily secured. However, if supplies cannot be secured, nor a substitute employed, and a revision of plans is not feasible, the project is not appropriate.

14. *Is cost within range of students?* If students are required to pay for all materials, the instructor should give some thought to their ability to pay. Projects which involve expensive material, such as plastic and leather, may be kept small and serve the same purpose as a large project.

15. *Is manipulative work hazardous for a given maturity level?* Upon checking the procedure, the instructor may find that there are numerous operations which would involve danger to the student, and thereby require the instructor to perform the operations. In most instances such a project would not be appropriate.

16. *Is it appropriate for the season?* If projects are introduced to a class at a time when they are appropriate to the season, the student's interest in a project will be increased. Prior to the duck hunting season, a duck call may be suggested to a group of wood-turning students, or a lamp at Christmas for a gift.

17. *Is storage space available?* If a shop does not have adequate storage space, large cumbersome projects should be discouraged. Invariably the same units of instruction may be taught through small projects as are taught through large projects. Stock will be conserved; furthermore, the shop and corridors will not be stacked to the ceiling with large projects in various stages of completion.

Drafting or Mechanical Drawing?

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All well-established professions — medicine, law, engineering, and others — are known the world over by *one, generic* term. The dictionary definition of a profession implies an occupation necessitating relatively long and specialized training, and involving the accumulation of a required fund of knowledge, as well as the development of all kinds of specific skills. In terms of this meaning, is drafting a profession? Let us examine this question more in detail.

Drafting Comes of Age

It is commonly conceded by all informed persons — educators as well as laymen — that drafting has now attained its full maturity in three well-defined areas: in education, in industry, and in vocational occupations. The factors upon which this maturity is predicated are varied and definite, and we shall now consider them separately and in some detail.

Drafting has now a body of "well-founded and well-defined" professional literature of its own, both on the high school and on the college levels. It has also a set of scientific principles of projection, definite conventions of representation of reality, and generally accepted methods of drafting room practice. The method of teaching drafting in our junior and senior high schools and colleges is usually grounded on a sound foundation. Its great inherent cultural and practical values are commonly recognized by all educators. Its place in the school curricula is now definitely assured.

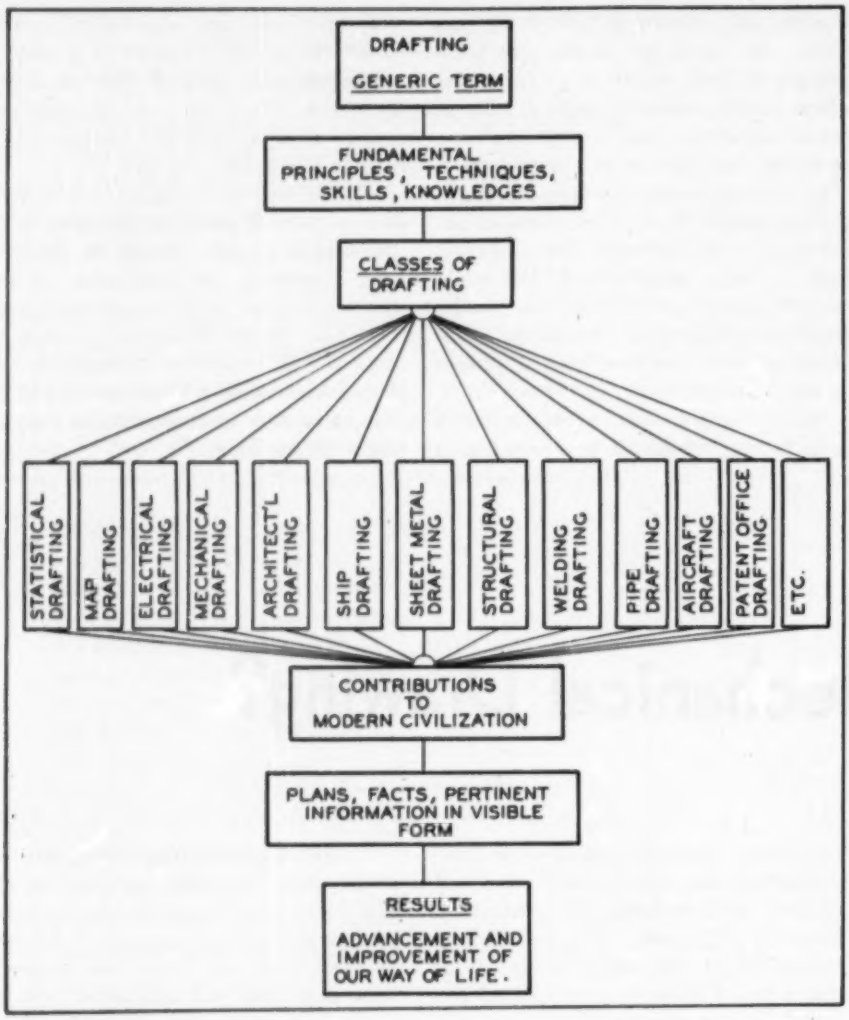
Drafting has also become one of the controlling factors in modern constructive enterprises of various sorts. The industrial drafting division is now an integral part of all manufacturing concerns, however large or small they may be. The success or failure of any manufacture depends to a large measure on what has taken place in the drafting room. Thus, the draftsman has now become one of the key figures in modern industry. In short, "drafting and manufacturing are so interdependent that development in the one is always accompanied by development in the other."

Occupationally, drafting has become one of the most important vocations in the past eighty years. There are literally many thousands of persons engaged in this area of work. The wage scales are relatively high, their range well established, and the qualification requirements are well defined.

The "Babel" of Terms

In view of the facts stated in the preceding paragraphs, would it not be highly desirable that this significant teaching as well as occupational subject should bear *one, definite, specific, generic* name, which would unequivocally designate its nature and occupational boundaries?

Alas, this is not the case! At present it has many names the meaning of which are overlapping, thus creating confusion and uncertainty as to its exact nature. The full impact of this inexactness in the meaning of terms may be readily sensed from the array of the following titles: mechanical drawing, graphic language, graphics, working plans, graphical methods, engineering drawing, graphical representation, mechanical drafting, practical drawing, industrial drawing, drafting, technique of practical drawing, drafting method, trade drawing.



Analysis of the Meaning of the Different Terms

Do these names listed above designate the same thing, or does each of the many appellations have a particular shade of meaning of its own? It is obvious that such an abundance of terms used for apparently the same thing does not clarify and specify its nature. Does it not seem clear that a choice of one *generic* name among the many should be made? Which one shall it be? Before a choice of an acceptable generic term can be made, we should first of all ascertain the exact meaning of the various names that have been enumerated. In order to accelerate this analytic process, they will be considered in related groups.

Group One: Graphical Language, Graphics, Graphical Methods, Graphical Representation.

These are wide and all-inclusive terms. The adjective "graphic" designates the art of writing or illustration of an idea by means of diagrams, curves, words, or pictures. It also means vivid, lifelike description of something. Practically anything and everything which uses lines, pencil, or pen may be included under any one of these terms. Although the field of drafting is extensive, it is not by any means all-embracing. For this reason, none of the terms in Group One can be used as a generic term to indicate accurately the activities of the draftsman in the industrial drafting room; nor can they be used to describe precisely the subject in our high schools known under the questionably narrow name of "mechanical drawing."

Group Two: Industrial Drawing, Practical Drawing, Production Drawing, Trade Drawing.

These terms narrow the meaning of the subject somewhat, and are more descriptive in nature than the ones in Group One; yet, even they are not entirely satisfactory to be selected as a generic name; for some of them are too narrow, others are too indefinite. Take the term *Trade Drawing*, as an example. What does it mean? Is this type of drafting unrelated to any other kind of drafting? Does it employ its own specific methods of delineation? The word *trade* delimits the subject too much, and does not clarify and specify its nature. Again, does *Industrial Drawing* pertain exclusively to industry? There are other activities, architecture, for example, which uses drafting, yet cannot be classified as an industry in the accepted meaning of the word. Then too, each of the titles in Group Two contains the word *drawing*, which usually is associated with the concept of the fine arts, such as pen and ink drawing, freehand drawing, sketching. The dictionary meaning of drawing is depicting objects on a surface with pencil, crayon, pen, or other graphic means of representation. The use of instruments in all delineation, as it is done in drafting, certainly precludes all relationship of this subject to the fine arts.

Something for or against may be said for each one of the terms in this group; but the few of them discussed here clearly show that they are not suitable to be used as generic terms for the subject under discussion.

Group Three: Engineering Drawing.

As far as the author knows, this term was first used by Professor Thomas E. French to name his book which was first published in 1911. This title may have been sufficiently descriptive of the subject matter considered in the first few printings of the work; but subsequent editions enlarged materially on the original scope of the subject; for in the sixth edition we find topics such as the following: *Welding Drawing, Pipe Drawing*. These two types are definitely trade and not engineering drafting. How can *Architectural Drawing* be classified under the title of *Engineering Drawing*?

It is obvious from the foregoing illustrations that the term *Engineering Drawing* is also too restricted and too narrow in its descriptive meaning to be used as a generic term for the whole field of drafting. Let us, therefore, continue our search.

Group Four: Mechanical Drawing.

The two terms *Fine Arts Drawing* and *Mechanical Drawing* are closely related in

time and place. In fact, originally, mechanical drawing was part of the general art drawing course, which was first introduced in one of the Boston schools by William Bently Fowle in about 1823. Several years later, in 1827, Fowle came across a French book on drawing by Louis B. Francoeur, which he translated and published under the title "The Eye and Hand." This work may be considered, in the narrow sense, as the first book on drafting in the United States. Its prime objective was "to teach the drawing of geometric figures, geometric solids, a few architectural elements, and such objects as urns, bowls, pitchers, and cruets in profile."

It is noteworthy that the term *Mechanical Drawing* was nowhere used in the early American schools. The subject matter offered certainly could not be called *Mechanical Drawing*, or *Drafting*, or *Graphics*. It was a mixture of a little of everything. In the long run, this kind of drawing proved to be totally inadequate to meet the needs and the demands of the rapidly changing industrial conditions of the New England states. Recognizing this fast developmental trend, and complying with the demand for a more practical or technical instruction, the Massachusetts legislature passed an act in 1870 which reads in part as follows: "Any city or town may, and every city or town having more than 10,000 inhabitants shall, annually make provisions for giving free instruction in *industrial* or *mechanical drawing* to persons over fifteen years of age, either in day or evening schools. . . ." As far as it is known, this is the first time that the term *Mechanical Drawing* was used to designate a school subject legally. This name has stuck to this subject to this day in spite of its narrow, ambiguous meaning.

Group Five: Mechanical Drafting, Drafting Methods, Drafting.

This group of terms possesses descriptive attributes which stamp them as generic in nature. Let us examine them more in detail.

The dictionary defines the word *draftsman* as "one who makes plans, maps, designs." The activity of, or the work performed by, the draftsman must, therefore, be designated as *drafting*. The end-results of drafting are plans, charts, maps, and other exact information necessary for the improvement and advancement of our mode of life.

Now, are plans, maps, designs, or charts *drawings*? To be sure, this term is often used by undiscerning people; but does it really describe their character? Does it tell what the draftsman produces in the drafting room? By the word drawings, we usually mean a representation of an object, a landscape, and the like, done with pencil, pen and ink, or crayon. Such drawings attempt to convey the feeling of contemplation or enjoyment of the object represented. Nothing of a practical nature can be constructed from such drawings. A plan, on the other hand, represents the object as it really is in shape and size, giving all the necessary details of construction, and all the information as to the methods of procedure so that the structure, however complex, can be built in its entirety. A plan, a chart, or a design always predicates action of some sort. The functional difference, therefore, between them and the term *drawing* is definite and clear cut.

Then too, in industry that division which prepares the plans, charts, designs, and specifications is the *drafting* department, not *mechanical drawing* department. Since we are teaching the language of industry, is it not right and proper that we should also adopt and use the terms approved by industry?

By way of summary, it may be said that the generic term *drafting* characterizes in general an activity which uses a definite system of lines, figures, conventions, employs a set of scientific principles of projection, and generally accepted techniques of procedure in order to describe accurately the size and shape of structures and mechanisms; records ideas in various visible forms, and conveys exact information to others so that certain desired productive activity may result from this knowledge.

This being the nature of the generic term *drafting*, the writer urges his fellow teachers to adopt it, and to use it in their school drafting rooms in place of the narrow term *Mechanical Drawing*. We should agree on *one* name which would fully and unequivocally designate the subject we are teaching. A glance at the appended chart depicting the extent of the field of drafting should convince all doubters of the functional value of *one, generic term*. This would give this significant subject a broader scope, a more specific meaning, and a professional status which it does not possess today.

PLAN FOR FIRE CHIEFS' INSTITUTE

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This study was undertaken to meet a need for an educational blueprint from which a fire officer development program could be constructed in the state of New York.

The proposed plan deals with a Fire Chiefs Institute designed to train firemen and fire officers for the administrative tasks which are encountered daily by supervision and management in every modern fire department.

Studies were made of training programs during the past twenty years. Approximately five hundred fire officers representing every county in the state attended a panel discussion of the problem: "Is there a need for training fire chiefs and senior officers in fire administration in the state of New York?" Much valuable evidence was presented supporting the need for a training plan for officer development. More than two hundred informal meetings and conferences were conducted with members of the New York State Association of Fire Chiefs as a consequence of this panel discussion. Informal, living-room type discussions with selected resource persons and organized conferences in the State Bureau of Fire Mobilization and Control were held to isolate and study fire administration problems and to obtain data.

An advisory group of selected fire officials provided technical fire guidance and critically examined and analyzed proposals made by the author.

Occupational analyses were made of a number of fire officer positions and a composite analysis of fire chief was obtained. Educational criteria were established based upon these occupational studies, and the status of present training programs was investigated using these criteria.

The organization of the Fire Chiefs Institute, the proposed curricula, and the operating policies were established and were reviewed by the Advisory Group of fire officials. Model legislation was included to permit legislative action to create the Institute.

The study was sufficiently comprehensive to warrant these conclusions and recommendations:

1. Fire departments are not in step with changes in the average community.
2. Fire department administration is increasing in complexity.
3. Present officer training programs are inadequate.
4. Fire officers are anxious to receive training in fire administration.
5. The state of New York must take the initiative in establishing training programs in fire administration.
6. Leadership development should be a primary objective of the Fire Chiefs Institute.
7. An institute-type organization will provide the educational medium to achieve the leadership development objectives.
8. Curricula of the Institute must be progressive and practical.
9. The Fire Chiefs Institute will require financial aid.
10. Model legislation incorporated in the study will provide the necessary organizational and operational authority.

Leaders in Industrial Education

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(Continued from page 305 of the November, 1952, issue)

CHARLES ALLEN PROSSER (Continued)

Further Delay

Although the report of the commission was submitted to Congress on June 1, 1914, the proposed legislation did not receive serious consideration until its enactment was urged by President Wilson in January, 1916. By that time the original bill had been revised by including provision for instruction in home economics in addition to industrial education for girls and women, and by changing the personnel of the proposed Federal Board for Vocational Education, to include the U. S. Commissioner of Education and four citizens to represent the special interests behind the bill.[11] In this revised form the bill received the endorsement and support of the Department of Superintendence of the National Education Association, the American Home Economics Association, and the Federation of Women's Clubs.

In the fall of 1915, Dr. Prosser resigned his position as secretary of the National Society to accept appointment as director of the William Hood Dunwoody Industrial Institute of Minneapolis. He was succeeded by Alvin E. Dodd of Boston, Mass., who had been principal of the North Bennet Street Industrial School since 1908. Upon Mr. Dodd fell the responsibility of co-ordinating the forces and carrying the campaign to its successful conclusion, which came with the signing of the Smith-Hughes Vocational Education Act by President Woodrow Wilson on February 23, 1917.

The Federal Board for Vocational Education

The enactment of the Smith-Hughes law marked the climax of ten years or more of strenuous effort. During the critical part of this decade Dr. Prosser was the inspiration and guiding spirit, the motivating force, that insured the ultimate success of the campaign.

The Smith-Hughes law provided for a Federal Board for Vocational Education, which was charged with the administration of the law. The board was to include three members of the president's cabinet, the Commissioner of Education, ex officio, and three citizens representing the interests to be served by the legislation. Early in July, 1917, the personnel of the board was announced, as follows: Secretary of Agriculture, David F. Houston; Secretary of Commerce, William C. Redfield; Secretary of Labor, William B. Wilson; Commissioner of Education, Philander P. Claxton.

The appointive members of the board were nominated by President Wilson on June 29, and confirmed by the Senate on July 17, as follows: Representative of Labor, Arthur E. Holder, Washington, D. C., legislative representative of the American Federation of Labor, appointed for three years. Representative of Agriculture, Charles A. Greathouse, Indianapolis, Ind., formerly state superintendent of public instruction, and holder of extensive farming interests, appointed for two years. Representative of Manufacture and Business, James P. Munroe, president of the Munroe Felt and Paper Company, Boston, Mass., appointed for one year.

The first meeting of the Federal Board for Vocational Education was held in Washington, in the office of the Secretary of Agriculture, on Saturday morning, July 21, 1917. At this meeting Secretary Houston was elected chairman of the board, and Commissioner Claxton was elected secretary. The board also created an executive committee to look after the business of the board during the intervals between meetings. This committee consisted of Commissioner Claxton, chairman, and the three appointed members.

Director of the Federal Board

It was decided to proceed immediately with the selection of an executive officer, who should be the head of the technical and administrative staff, and who was to be designated director. It

[11] Charles A. Bennett, *op. cit.*, pp. 547, 548.

was a remarkable tribute to the man, and recognition of his ability and attainments, when the immediate and unanimous choice for this responsibility fell upon Dr. Prosser. Looking back upon that period from the perspective of later years, it seems obvious that there was literally no one else for whom a claim of priority could have been sustained. And if for any reason Dr. Prosser had been unable to accept the assignment, it is extremely doubtful that anyone else then active in the movement could have successfully met the exciting and well-nigh overwhelming demands of the hour.

Dr. Prosser was called from Minneapolis for a conference with the members of the board on Monday, July 30, 1917, and was appointed director at the second meeting of the board which was held on Friday, August 3. In the meantime Dr. Prosser secured temporary leave of absence from his duties as director of Dunwoody Institute.

Relation to General Education

The next few weeks were extremely busy and eventful. Having finally won the struggle after ten years of strenuous effort, the friends and supporters of vocational education were anxious to see the results in action. Dr. Prosser and the members of the board were in full sympathy with this desire, and moved with all possible expedition. Shortly after Dr. Prosser's appointment as director, he and I met one day on one of his visits to the Bureau of Education (now Office of Education). I remarked that Commissioner Claxton had discussed with me the possibility of regrouping our offices so as to vacate one or two large rooms, which might be placed at the disposal of the staff of the Federal Board for a limited time. These rooms would provide temporary quarters during the period of organization. Later, when something definite was known about the size of the staff, and the amount of office space that would be needed, it would be possible to shop around for rented quarters. It had already been determined that no space was available in any government building.

I remember very distinctly Dr. Prosser's reaction to this suggestion, because it was quite unexpected. His reply was: "No, sir; we don't want to be tied up with the regular public school system in any way. We learned our lesson once, and we are not going to permit the traditionally minded superintendents and principals to do to vocational education what they did to the manual training movement. We intend to stay away from the Bureau of Education, keep our vocational education separate and independent, and thus avoid any ground for suspicion that vocational education will ever be dominated by general education."

He then reviewed the experience of manual training, as outlined in the report of the first Douglas Commission and elsewhere, and pointed out that manual training had been set up originally with some of the same objectives as those envisioned for the new program of vocational education. Manual training had failed of its original hopes and purposes, because of the lack of vision, lack of sympathy, and ineptitude if not mismanagement of the regular public school administrators. It had been determined that the same mistake would not be repeated with vocational education.

I had several conversations with Dr. Prosser on this point, which seemed to me to represent a fundamental issue. I tried to argue that superintendents, principals, and members of boards of education, as well as the general public, were much better informed, and more keenly and genuinely interested in the well-defined objectives of vocational education than an earlier generation had been with reference to the more nebulous and ill-considered concepts of manual training.

I urged the possibility of eliminating or counteracting the forces and factors that had prevented the realization of some of the earlier manual training movement. Most important of all, I tried to show that more could be accomplished with and for vocational education if it were made a vital and integrated part of a unified program of public education, with the active cooperation of superintendents and boards of education, than could ever be hoped for from an independent agency which would have to contend with the antagonisms that might be engendered by the issuing of instructions, memoranda, and "directives" from the outside.

I never made any headway along this line, either with Prosser or with any other member of the technical staff. I soon came to understand that the policies which prevailed from the beginning had been incubating for some time, and were not even considered debatable by most of the staff.

This attitude of aloofness was overruled temporarily when the activities of the Federal Board got under way, for the initial conferences called by the board with representatives of the states were actually held in rooms provided by the Bureau of Education, which was at that period housed in the old Pension Building. Beginning on August 17, a series of conferences was held at which representatives of the various state departments of education met with the staff of the Federal Board to discuss policies, plans, and procedures. The 48 states were divided into five groups, and two days were assigned to each group.

On Thursday, August 30, 1917, the Federal Board for Vocational Education moved into rented quarters on the fifth floor of the Ouray Building, an office building located at 8th and G streets, N.W.

Two Years of Achievement

Dr. Prosser served as director of the Federal Board for Vocational Education for two years, August 3, 1917, to August 31, 1919, after which he returned to his post as director of Dunwoody Institute in Minneapolis. These were two strenuous years, which encompassed an amazing record of achievement. The enactment of the Smith-Hughes Vocational Education Law was an epoch-making event, since it established the principle of federal aid through the states to certain types of schools and classes of less than college grade. In certain important respects this legislation was based upon the experience with the Morrill Act of 1862, which established the Land Grant Colleges. In other respects, as an expression of public policy, the Smith-Hughes Act embodied some important departures from previous legislation.

By providing for specified types of training in the public schools of less than college grade, the controlling purpose of which must be to fit for useful employment, and designed to meet the needs of persons over 14 years of age, the new act proposed to minister to a large group of the population that had not up to that time been reached directly by the Federal Government. Indeed, the new law contemplated services to young people which had been generally neglected not only by state legislation but by city school systems as well.

A brief summary of the functions of leadership imposed upon the Federal Board of Vocational Education will serve to suggest the enormity of the task assumed by Dr. Prosser and the members of his administrative staff during these two eventful years:

1. At the outset it was necessary to prepare authoritative and detailed statements of policy and interpretation of the law. In order to accept the provisions of the federal law it was necessary for each state to take formal action, to set up prescribed machinery, and to enact legislation providing for the inauguration of programs at the community level. It was an enormous task to prepare the necessary instructions to guide and assist in these procedures.

2. In some states little if any experience with vocational education of less than college grade could be drawn upon, plans and programs were nonexistent, trained teachers and supervisors were not available, and in some instances it was necessary for the Federal Board to provide the initial leadership.

3. An almost endless series of conferences with representatives of the several states was necessary to assist in the formulation of state legislation, the preparation of state plans, the selection of leaders, and the organization of administrative staffs.

4. It was necessary to inaugurate plans that would lead at the earliest possible moment to an adequate supply of qualified teachers, as well as of supervisors and other administrative officers at both state and community levels.

5. To assist in getting the program under way it was decided to establish regional offices, and much time and effort were required to recruit the trained and competent personnel for these offices.

6. It was necessary to formulate instructions for procedures to be followed by state boards in approving the claims for reimbursement submitted by county authorities, as well as procedures to be followed by the Federal Board in approving claims submitted by the state boards.

7. It was necessary to establish a comprehensive system for the disbursement of the funds provided by state and federal laws, including the necessary procedures of reporting, accounting, and auditing.

8. Decisions concerning the details of certain parts of the program of vocational education were dependent upon information not then available. It was necessary, therefore, for the Federal Board to establish immediately a division of investigation and research, and to inaugurate the publication of a series of studies of vital problems of administration of vocational education, curricula, instruction materials, methods of instruction, the preparation of teachers, and others; also to encourage the making of such studies and investigations by others.

9. It was necessary also to create a division of publications, and to begin the preparation of an exhaustive series of bulletins and reports to aid the states and communities in the establishment and maintenance of schools and classes of many types.

An adequate and informative report on the organization and achievements of the Federal Board during this critical period has been made by the men who were directly responsible at the time, and it is, therefore, unnecessary to go more fully into the record here.[12]

It should be added that the executive staff of the Federal Board was organized in the latter part of August, 1917, and operations got under way at just about the time the new school year opened in September. Because of previous experience a few states and communities were ready to go as soon as they could be given the "green light." Authorities in nearly every state were eager and anxious to learn about the conditions and requirements that must be met in order to qualify for its share of the federal funds. It is difficult to exaggerate, therefore, the tremendous pressure for immediate action under which Dr. Prosser and the members of the administrative staff found themselves during this momentous period.

[12] L. S. Hawkins, C. A. Prosser, J. C. Wright, *Development of Vocational Education*, American Technical Society, Chicago, 1951. See especially Chap. 14, "The Federal Board for Vocational Education," and Chap. 15, "Administrative Policies of the Federal Board" pp. 135–179.

The Industrial-Arts Teacher as a Vocational Guidance Counselor

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The purpose of this article is to present the essential requirements of a guidance counselor and to show how the industrial-arts teacher can play his role. This stems from the philosophy that every teacher of necessity does counseling to a greater or lesser degree and the industrial-arts teacher is in a unique position in this respect. As John Dewey said:

"An occupation is the only thing which balances the distinctive capacity of an individual with his social service. To find out what one is fitted to do and to secure the opportunity to do it is the key to happiness."

I. What are the general prerequisites for a counselor?

A. An awareness and sensitivity to the students' problems.

The industrial-arts teacher in his day by day relationship with the student is constantly helping him solve problems. These problems are generally confined to the work at hand. However, the teacher who is aware and sensitive to other prob-

lems which the student expresses directly or indirectly can accept the challenge and counsel the student.

Specifically a remark, "My father does not want me to be a carpenter, he wants me to go to college," is overheard. The industrial-arts teacher can ignore the remark or accept the challenge. He can first check the student's grades in school, the results of any standardized tests, get the opinion of other teachers, and the like. Thus, he has laid the foundation for his counseling. At an opportune moment, he can open up the whole subject and discuss it with the student. His closeness to the student, the informal relationship and the fact that he is constantly helping the student with his other problems serve him in good stead.

B. Personality

The personality of the industrial-arts teacher as with other persons who come into contact with students, must be pleasing, receptive, and understanding. The best clue to the right personality attributes is to see to whom the students go when they have problems or are in need of counseling.

C. Background

The industrial-arts teacher brings a rich background to the school. His formal education may be somewhat limited but his industrial and work experience is varied and practical. He is generally aware of the realities of the world of work through these experiences and can guide the student through the maze that is represented by occupational information, entry into the world of work, aid in placement, and finally plans for progressing in the work world.

II. How can the industrial-arts teacher develop his ability to guide and counsel students?

A. Formal guidance courses may be taken at teacher's colleges, colleges, and universities. This will enable him to get a formal education and at the same time get other points of view.

B. Join one or more community agencies to learn their functional purpose. This may help in referral of students for psychological or psychiatric treatment or in placement.

III. Conclusions

A. The industrial-arts teacher is in a unique position to guide and counsel students because of his closeness to them, his direct but informal relationship with them and his friendly working relationship with them all of which are conducive to a good basic understanding of the student's problem.

B. The industrial-arts teacher brings into the school that touch of reality which can be gained only through direct experience. Our schools are sadly lacking in personnel who have these experiences and possess this background.

C. The industrial-arts teacher can therefore play a key part in counseling students on the basis of his knowledge, background, and experiences and can be a powerful force in promoting guidance activities in vocational schools.

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A Basic Glossary and Vocabulary in Printing

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(Continued from page 335 of the December, 1952, issue)

R

rabbeted surface
reference marks
reglet
reprint
revise
revised proof
right fist
Roman numeral
Roman type
rough proof
round letter
rule
  brass
  column
composing
makeup
pica
strip
rule cutter
run in
run over
runs

(Straight Composition)

raised initial
regular verse

RECTO: From rectus meaning "right." The right-hand page of a book or folded sheet of paper. The opposite of verso, the left-hand page.

REFERENCE MARK: Any mark used to call attention to a footnote or other notation, such as superior letters or figures, asterisks, daggers, and the like.

REGLETS: Thin strips of wood similar to leads, less than type high, and made in various thicknesses from 60 to 36 points. They are used in locking up forms.

REPRODUCTION PROOF: A proof of type matter to be used for reproduction purposes in photolithography or photoengraving.

ROMAN: Type faces on the style of characters used on stone inscriptions of the Romans. The up and down strokes of the characters are upright in contrast to the sloping strokes of italic fonts.

RULE: A thin piece of type-high metal used for printing lines of various thicknesses. There are many kinds of rules: single, parallel, double, dotted wave, scoring, perforating, cutting, and so forth.

RUNNING HEAD: A line at the top of a page showing the title of a book, the chapter or the subject, and usually the folio number.

RUNNING TITLE: *See* Running Head.

S

salaried earner
seasonal employment
secondary
section mark
semicolon
sentence
series
serif
set
shoulder
simple sentence
sketch
skilled labor
sloping letter
slug
slug cutter
small caps
solid
solid matter
sorts
space
  5 em
  4 em
  3 em
  hair
  take out
  thin
space in
spacing
  bad
  letter
  word
space out
specifications
spell out
sprung
squeeze
stand
standard
standing matter
statistics
stereotyping
stet
stick
stickful
stitching
stone man
stone proof
straighten form
straighten lines
straight matter
style
  composition
  general local
  office
  sheet
sub
swash letter
syllable

(Straight Composition)

sans-seriff type
skinny letter
stanza
strip rule
sunken initial

SADDLE STITCH: A method of stitching where the center of the folded sheet is placed over the saddle of the stitching machine, the staples being driven through and clinched on the other side.

SANS SERIF: Type faces without serifs.

SCORING RULE: A rule used to score cardboard or heavy paper; slightly more than type high. Also called creasing rule.

SCRIPT: Type faces patterned in imitation of plain or ornamented handwriting.

SERIF: A fine line, usually a cross stroke, on the face of a letter, which serves as a finish to unconventional lines of the letter, giving the type face its distinctive style.

SHEETWISE: A method of imposing and printing in which a different form is used for each side of the sheet.

SHOULDER: The flat part at the top of the type body which supports the neck and face of the type.

SIDE STITCH: A binding method in which the thread or wire is stitched through the side of a folded sheet instead of through the center of the opened fold, as in saddle stitching.

SIGNATURE: A letter or figure placed at the foot of the first page of each sheet of a book or pamphlet to serve as a guide in assembling and binding after the sheet is folded. A printed sheet containing four pages or multiples of four, folded and numbered to form one unit of a book or pamphlet.

SINGLE RULE: *See* Slug.

SLUG: A strip of metal less than type high and not less than six points thick, used to space between lines of type or to fill a blank space in a form. A line of type set in one solid slug such as that set on the linotype or similar machine.

SPACES: Pieces of metal less than type high used to produce the white space between words, and to justify lines. They are cast in subdivisions of the em measurement, such as 3-to-an-em (3-em space), 4-to-an-em (4-em space), and 5-to-an-em (5-em space).

SPOILAGE ALLOWANCE: A certain percentage of paper, over and above the actual amount required to print a job, allowed for spoilage in making ready for press, press runs, and other operations such as folding, stitching, sewing, gathering, ruling, numbering, color work, gumming, tipping, and the like.

STEREOTYPE: A metal printing plate cast in a mold from a matrix or mat which has been made from the desired printing surface.

STET: A word derived from the Latin, *sto*, meaning to stand or endure, hence let it stand. Used by proofreaders to indicate that matter already marked to be changed or corrected is to remain unchanged. Dots are placed under the words that are to remain as they were originally.

STONE: *See* imposing stone.

STONEMAN: One who imposes and locks up forms preparatory to printing.

STONE PROOF: A proof of type matter taken while it is still on the imposing stone.

STONEWORK: Work done at the imposing stone or table, such as imposing, making up, and locking up forms.

SUBSTANCE: *See* Basis Weight.

SUPERIOR: A small letter or figure cast toward the upper part of the type body, partly above the regular type line, used as a reference mark, in equations, formulas, and the like.

SWASH LETTER: A letter having serifs and flourishes which extend beyond the word in which it is used, usually a capital letter.

T

tabular matter
take
take out
tall letter
text
text type
thirty
three-em-space
throw in
thin space
tin
tight line
time and a half
time sheet
toenails
trade association
transpose
transposition
trade term
trade publication
trimming
troublesome letter
turned letter
turn over
turning for sorts
tying up
type
  body
  boldface
  brevier
  cabinet
  century
  character
  Cheltenham
  case
  copperplate
  display
  extra condensed
  face
  family
  foundry
  high
  high gauge
  high planer
  Italic
  light face
  line
  job
  metal
  movable
  nonpareil
  pica
  planer
  Roman
  text
  series
  setting
  size
  wood
  typography
  typewritten copy
  tweezers
  two line letter

(Straight Composition)

two point full face rule

TABLE OF CONTENTS: A table preceding the text, which lists the contents of a book, chapter by chapter, unit by unit, or section by section, in the order of appearance without regard to alphabetical sequence.

TITLE PAGE: A page preceding the body or text of a book, giving its title, the name of the author, the publisher's imprint, the date of publication, and the like.

TYPOGRAPHY: The art of printing with type. The design, style, appearance or arrangement of matter printed from type.

TYPE BANK: *See* Bank.

TYPE CABINET: An enclosed hardwood or steel frame used for the storage of type cases.

TYPE CASE: *See* Case.

TYPE PLANER: *See* Planer.

U

underscore
unedited copy
unit
unskilled labor
upper case

(Straight Composition)

underscoring rule

UNIT: One-eighteenth of an em (setwise) according to the monotype unit system.

UPPER CASE: The upper of a pair of news cases, in which are found capital and small capital letters; hence the name applied to capital and small capital letters of the alphabet.

V

verify vowel
vertical

VERSO: From *versus*, meaning "to turn." The reverse of left-hand page of a book or folded sheet of paper. The opposite of recto, which is the right-hand page.

W

wage earner wood type
wall chart word division
weight word spacing
wood furniture wrong font

WIDOW: A short line at the end of a paragraph when placed at the head of a column or a new page.

WORK-AND-TUMBLE: A method of imposing by which the pages for both sides of a sheet are arranged in one form, which is then printed on one side of paper large enough for all the pages. The sheet is then turned over from right to left instead of from left to right as in work-and-turn forms, printed on the reverse side, and cut in half to make two pieces.

WORK-AND-TURN: A method of imposing by which the pages for both sides of a sheet are arranged in one form, which is then printed on one side of paper large enough for all the pages. The sheet is then turned over end for end instead of from right to left as in work-and-tumble forms, printed on the reverse side, and cut in halves to make two copies.

WRITING PAPERS: A variety of papers ranging from bonds and ledgers to flat writing, which are suitable for use with pencil, ink, or typewriter, and permit of erasures.

WRONG FONT: A wrong type face in a word or line of type, caused by the characters of one font being mixed with those of another. Frequently abbreviated to wf.

Stay Young Professionally

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The remark, "It must be boring to teach the same subject, semester after semester," is sometimes made by experienced teachers. If the same subject were to be taught by the same method then it would be uninteresting to teacher and pupil alike. If the teacher has a philosophy of education which accepts the child as the center of the school, and directs his teaching to develop that child, then the teacher will remain alive professionally and teaching will never be boresome. It follows too, that one's methods will of necessity be ever changing. This idea may be "old stuff" to many teachers, but look around and notice how many teachers have lost their *spark*.

Generally speaking, we think of youth as the formative period when we are willing to adopt new techniques and methods — when we are not afraid to try out new ideas. One of the youngest teachers I was ever privileged to know retired recently, after forty years of service. He always liked his job and has been heard to make the remark, "here I am having a barrel of fun and getting paid for it too." If one is in good health there is no excuse for the stagnation which sometimes follows as one settles down to the grim task of making a living for himself and family.

The following ten points are addressed to young teachers and to teachers who want to stay young. There has been no attempt on my part to rank these points according to their importance. Although written with the industrial-arts teacher in mind, most of the points are applicable to other teaching areas.

1. Develop present shop facilities to their fullest. Do not be so hasty to add new areas of learning that present areas are neglected. In the general shop one should add new areas as time, need, and interest permit. If one is not careful his teaching may be spread so lightly over such a great amount of subject matter that a poor job is done on all of it.

2. Take additional training. This need not necessarily be for credit but for subjects which you have always wanted to study but could not find time for in the regular college situation. This is a good way to get acquainted with leaders in the field. By attending summer sessions and learning to know these men, one's philosophy of industrial education and life will be broadened and enriched.

3. Take active part in professional educational organizations such as: Epsilon Pi Tau, Phi Delta Kappa, Industrial Education Clubs, and other such organizations. Organizations operating on local, state, and national levels offer many opportunities for service and leadership. Be more than a passive member! Carry your share of the responsibilities by serving when requested as committee member, officer, and the like.

4. Contribute to your profession by writing for magazines, newspapers, etc., as opportunity permits. Perhaps you have an idea — big or small — that is new and good; then it is your obligation to share that idea with your profession.

5. Visit other shops when possible. See your fellow teachers in action, inspect their equipment, learn firsthand how they get things done. Visitation is one of the most fruitful experiences any teacher may have.

6. Get industrial experience. In these days any shop teacher who does not take advantage of this opportunity is missing the boat. I feel that trade experience teaches more in a similar period of time than it is possible to learn in any school shop. Furthermore, since one can almost pick the job desired, varied experiences may be gained every summer. One will gain new skills and more important — a new outlook upon life by punching a time clock and sharing the working conditions with the man in overalls.

7. Be willing to change your teaching methods when better ones are devised. I have seen teachers who use the same lesson plans and tests semester after semester. Teaching is more than a quiz program.

8. Read your professional magazines and new books. Examination copies of new teaching aids are always available at state and national professional meetings. Many book companies will mail inspection copies for your examination, such copies being returnable if they do not measure up to your expectations.

9. Respect the opinions of your pupils. Remember that they are as wise for their years as you are. Pupil ideas may need to be toned down a bit but a better teacher-pupil understanding will be developed.

10. Be interested in the work your pupils are doing. Keep in touch with each pupil, know his problems, and show your interest by a friendly attitude and through helpful suggestions.

Industrial Arts and Vocational Education
John J. Metz, *Editor*

HOW DID YOUR 1952 SAFETY EFFORTS TURN OUT?

In the September issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION there appeared an editorial under the title "Startling Facts." This editorial pointed out the necessity of paying serious attention to the teaching of safety to the students in the school shops of this country. This was good advice to give at the opening of the new school year.

But now we are at the beginning of a new year. About four months of the school year 1952–53 have elapsed. Have our attempts at teaching safety been fruitful? If they have — good! If not, ought we not redouble our efforts at making our students safety conscious, not only in avoiding the accidents that may befall them in their homes, on the streets and highways, and on the playgrounds, but also in the activities of life in business and industry for which we are preparing them.

It is to be hoped that the accidents of the year 1952 were not quite as numerous as those of 1951. But now the year 1953 is about to start. Surely we want to make another reduction in the frightful numbers that annually stared us in the face by the end of each year. Let us hope that 1952 shows a decrease, but let us start right now to make certain that 1953 will show a definite improvement over the year ending on December 31.

SEASON'S GREETINGS

It is quite painful to reflect that our Christmas and New Year's greetings must still be tinged with sorrow and distress because thousands of families are fearfully cognizant of the fact that their sons are exposed to the uncertainties of war (or should we say *Police Action*) in an effort of thwarting the fiendish plans of Communistic Moscow.

It is difficult to look upon the suffering of our boys in Korea, with the sentimental attitude that Washington has so long maintained. To save our American youth, it seems that we have waited overly long with using the strength we were led to believe that the U.N. — which means largely armed forces of our country — could exert. If that is possible, let us exert it and save our youth from being brutally slaughtered.

With the hope, then, fostered by the change brought about by the last election, that our government will at least attempt to do something worth while in Korea, let us pray that the peace of Christmas may once more visit the world, and with that prayer in mind, INDUSTRIAL ARTS AND VOCATIONAL EDUCATION wishes its readers peace of mind and soul for Christmas and the New Year.

WHAT DETERMINATION WILL DO

A young veteran of Winston-Salem, whose name is purposely withheld, has been in a Veterans Administration hospital for five out of the past ten years as a tuberculosis patient.

This young man of 33 had an interest in journalism since his youth. At 18 he obtained a job as copy boy at the *Washington Star*. Then he joined the navy and his service brought him to Samoa, Panama, Cuba, Newfoundland, and Iceland.

In 1942, navy doctors discovered he had pulmonary tuberculosis. He was discharged and sent to the Oteen V.A. hospital. In November, 1945, he was discharged as an arrested tuberculosis case.

He still wanted to get into journalism, and applied at the Veterans Administration for training. He was advised to get some general college studies, before tackling his chosen subject.

He enrolled for two years at Western Carolina Teachers College at Cullowhee, N. C. During school hours, he assisted with college publicity and was correspondent for the *Asheville Citizen-Times*. Then he enrolled at the University of North Carolina.

In 1949 it was discovered that his tuberculosis had become active again. He was ordered back to Oteen. Before he left school, he made arrangements to continue his studies by correspondence.

After he had improved sufficiently to resume his studies he applied himself so well that his high grades merited for him membership in the honorary Phi Beta Kappa scholastic fraternity, besides an A.B. degree in journalism.

Another veteran whose ambition was to become a sculptor, had studied at the Beaux Arts Academy and at the Art Student's League in New York.

One of his pieces, "The Tumblers" won the National Scholastic Contest, and as a consequence he was awarded a four year scholarship at Carnegie Tech.

The war interrupted his plans, and he gave up his scholarship temporarily to enlist in the army air force in 1942.

In 1944 he was flight engineer on a B-24, serving with the 13th Air Force in Palawan near the Philippines. During a raid, his plane was hit. Two of the crew were killed, and he was severely injured.

After having been examined at the emergency aid station he was informed by the doctors that they would have to amputate both of his arms.

After the operation he was transferred to an army hospital in California. It took him a few months to get used to the idea of going through life without arms. He had a "pleasing" tenor voice, hence he decided to switch careers — from sculptor to singer.

He joined a small group who went from ward to ward to sing for the patients. An Army Special Services officer heard him and got him a singing spot over a Pasadena radio station. A composer-conductor signed him up for a 13-week contract as a singer on a radio show.

From there, he moved to a radio station in New York City, where he had his own singing program for 20 months.

Then the Veterans Administration enrolled him in a music school to study sight singing and music composition. He received numerous invitations to appear as guest star on television shows.

Finally, in June, 1952, he was signed up by a well-known record company. His first records were released two months ago.

Examples like this may well be placed before our students. It will give them an opportunity to see what determination has done for students who have been tied down to hospital beds because of ill-health. It may arouse some of the more ambitious ones to emulate the example set for them by these young men who have been permanently incapacitated to follow their early plans, but who are ambitious enough to try once more, even in an entirely new field of endeavor.

Incidentally the teachers may have an opportunity to gain recruits to fill the rising needs of teachers of industrial arts and vocational education.

PROBLEMS AND PROJECTS

MODERN OAK END TABLE

KENNETH R. FECHTER
High School
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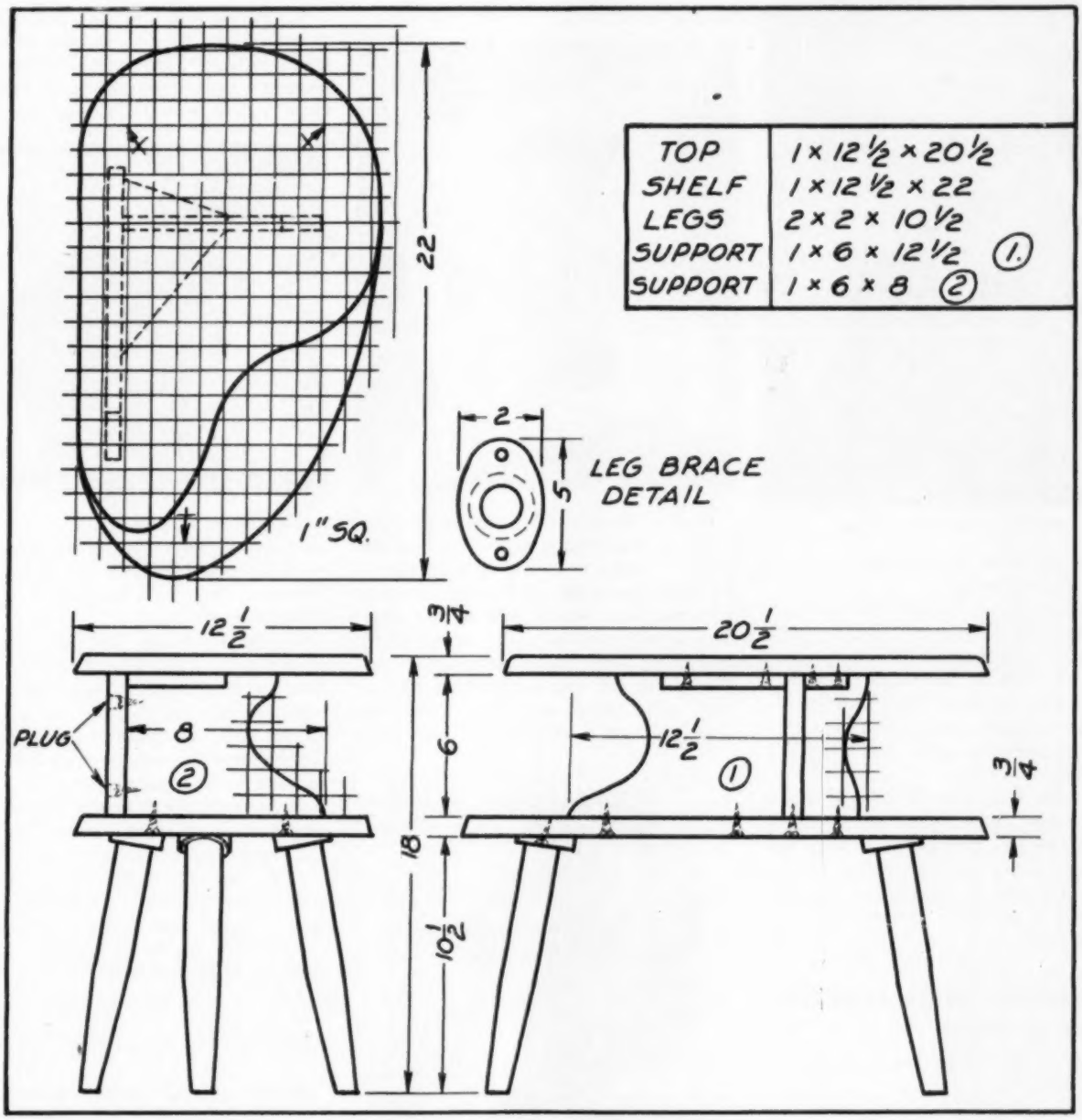
Here is a project that deviates from the traditional type of construction and yet fulfills the requirements of good design. It requires comparatively little time to make, but it will challenge the ingenuity of the student. It can be made in pairs for either side of divan or chairs by reversing the top patterns.

Details of Construction

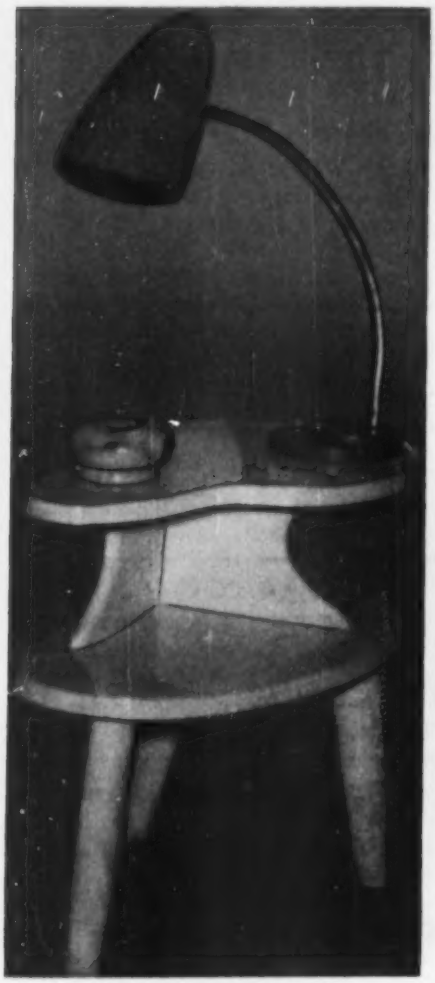
Lay out all patterns full size on any large paper such as wrapping or detail paper.

The legs are turned from 2-in. stock and they do not taper until 4 in. from the floor.

The top of the legs are recessed to fit the opening in the leg brace. The legs on this project were made oval by offset turning; however, little is gained in looks by this method. Round legs, therefore, are shown in the drawing. The legs are then glued into the leg brace and planed to the proper angle (10 deg.). The legs are placed on the bottom



Details of modern oak end table



Modern oak end table

shelf slanting in the direction indicated by the arrows on the drawing.

Supports 1 and 2 are made of 1-in. stock. The front curve on support 1 and the curve on support 2 are identical. After these curves are cut the edges are rounded by hand.

Two triangular pieces of stock are used to fasten the top to the supports. This should be completely assembled before it is fastened to the shelf.

The table shown is made of limed oak. It does not show the rich grain pattern that is present with this type of finish. It is suggested that wash coats of shellac (1 part shellac to 6 parts of alcohol) be used after the bleach to prevent the natural color from blending back.

ADVANCED WALL PLAQUES

WILLIAM LEE HODGE
Palmer Elementary School
Springfield, Ill.

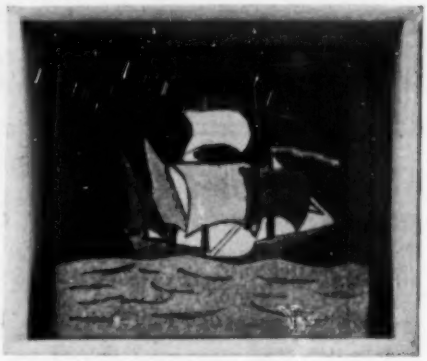
In the November, 1950, issue of the INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine, there appeared an article entitled "Wall Plaques." Since that time, the author has been experimenting to make better plaques with more educational value and which provided greater variety for the students.

The procedure followed in making the first Upson Board wall plaques is as follows:

1. Obtain design.
2. Trace design on Upson Board and cut out using a coping saw.
3. Woodburn detail lines.
4. Apply kerosene and the crayon — smudge with finger.
5. Color background piece and glue design to it.

This is basically the procedure outlined in the article published in November, 1950.

Some of the advanced techniques are shown in the accompanying pictures. The Pinocchio plaque is similar to the first types of plaques but differs in the size and detail of the figure. Pinocchio is only 4½ in. high on this plaque. Another difference is in the design of the background piece. The background was first woodburned and then painted four different colors (blue, yellow, orange, and white) with a water tempera paint. Pinocchio was colored



with crayons using kerosene to dissolve the crayon.

Another pleasing effect has been achieved by cutting out a figure so skillfully as to keep intact the piece from which it is cut. This provides a *shadow* for the figure when the figure is glued to it. The George Washington

profile, and the Irish setter, are examples of this type of work. George Washington is painted with tempera while the setter is done in crayon. Both are mounted on tempera painted Upson Boards.

The most complex of these advanced plaques is the model sailing ship. This plaque gives a shadow-box effect, being almost 3 in. deep. The ship and the water are colored in crayon, while the "shadow" and background are painted with tempera. Apple-crate wood was used for the frame of this plaque.

In summary, the making of advanced wall plaques of Upson Board includes:

1. Finer detail of cutting and woodburning.
2. The use of coloring agents other than crayons (and kerosene), such as tempera paints, airplane dope, gold gilt, and the like.
3. Carefully cutting the object out and then using the *scrap* piece from which it was cut as a shadow or by itself as a profile.
4. Building up the object on different planes and then putting a deep frame around it.

Needless to say, student interest is increased by the methods just outlined. This is especially true if the first work on plaques

is done in seventh grade and then the more advanced techniques applied in the eighth grade. Students enthusiastically bring in drawings of cars, cartoons, jet planes, and animals for this work.

HIGH-CONTRAST CHALK BOARD

CHARLES R. BRITTING
Junior-Senior High School
Quakertown, Pa.
and
HOWARD H. RAHMLOW
Central School
Clinton, N. Y.

The conventional slate blackboard has long been of great value in the field of education. It does, however, have a definite disadvantage, which is quickly recognized by those who use it. White chalk on a freshly washed blackboard produces good contrast. Erasing soon turns the black to gray and valuable contrast is lost. The use of colored chalk on the blackboard often leaves much to be desired. With these facts in mind, the device described here was developed.

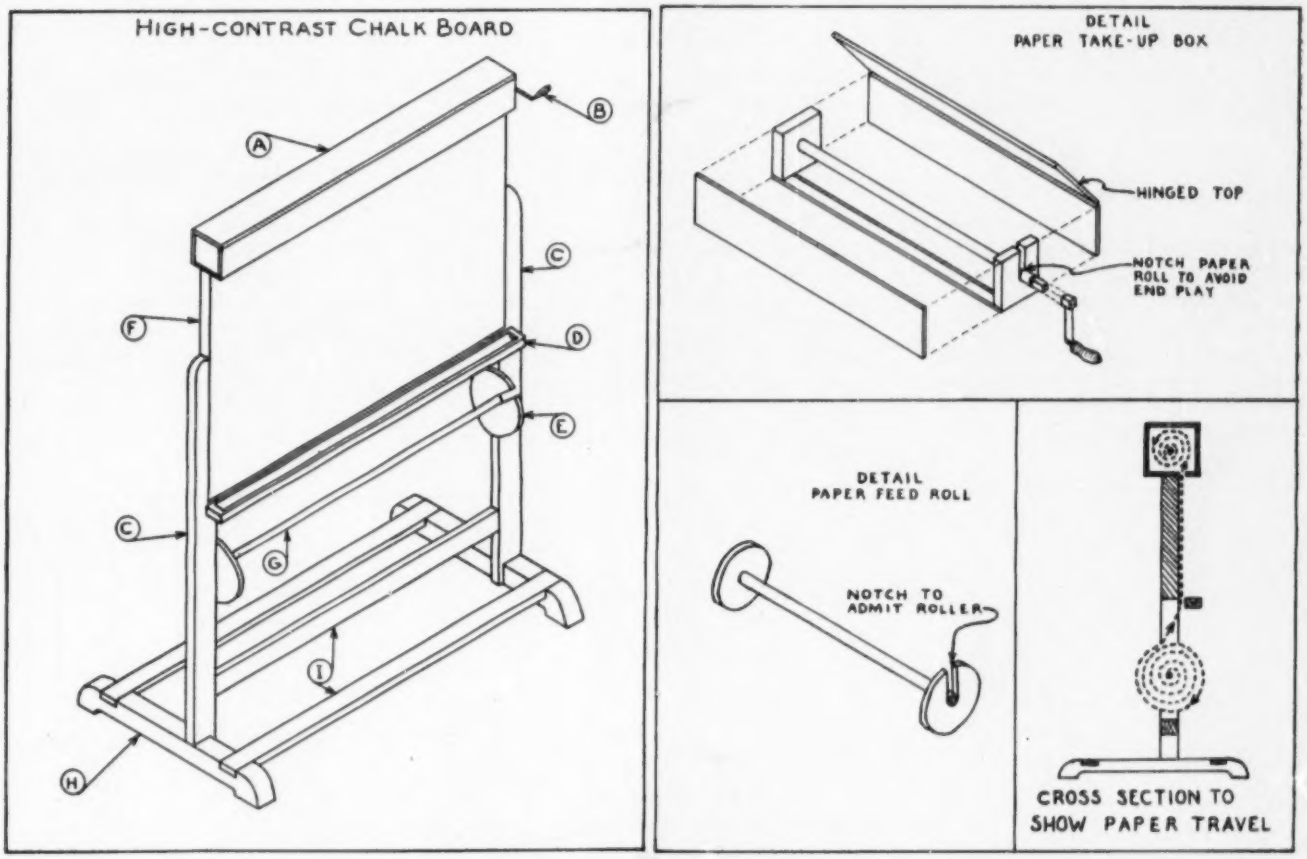
Exact dimensions are not included here for it is hoped that the individual teacher will adapt the principle to fit his own situation. Although the model described is portable, there is no reason why a permanently placed unit could not be constructed. Major dimensions are given in the "Parts List," which follows to serve as a general guide to construction.

The original model was attached to a portable blackboard and is illustrated herewith. This adds versatility to the unit by making both mediums immediately available.

The paper used is available from many of the large paper supply houses. It is a newsprint type and is distributed in rolls which are 36 in. wide and about 9 in. in diameter. The cost is about six dollars a roll. It has been found that one roll will last over two years in a comprehensive general-shop situation.

Construction does not involve any difficult or unusual building techniques. Care should be taken to round and smooth any edges over which the paper must travel, to avoid snagging and tearing.

The time involved in building will be repaid many times over. The advantages of this unit over the conventional slate board are numerous. The inherent value of colored chalks is more fully utilized through the



Parts List

(Refer to assembly drawing)

A — Paper Take-up Assembly. 5 by 5 by 39-in. outside dimensions. Top, bottom, and sides made from ¾-in. plywood. Ends from ¾-in. plywood. Slot in the bottom to admit paper. See detail.

B — Take-up Roll Crank. Build to suit and attach permanently to the take-up roll.

C — Upright Posts. 1 by 2 by 64 in., two required.

D — Chalk Tray. 2 by 3 by 39 in., set below the backing board to form a slot through which the paper can pass from the roll.

E — End Disks. 10-in. diameter. Use ¾-in. plywood, two required. Cut radial slot in one to admit roller. See detail.

F — Backing Board Assembly. 30 by 39-in. outside dimensions. If desired, a slate board may be built into the reverse side of this unit. The side which will serve as a backing for the paper should be of tempered hardboard to insure a smooth writing surface.

G — Feed roller. The feed roller and the take-up roller should be made of pipe or dowel rod. The outside diameter should conform to the size of the hole in the roll of paper used.

H — Base Pieces. 1¾ by 2¾ by 30 in., two required. Install glides or casters to facilitate moving the unit.

I — Stretchers. Make two 44 in. long and one slightly shorter to fit between the upright posts.

Braces. Install braces as required to make the unit sturdy, durable, and stable.

The high-contrast chalk board in use

crisp, clean contrast which is achieved. Many drawings can be immediately at hand without having them scattered all around the walls of the room. All drawings have the same visual vantage point in the room. A vast writing area is available without the bother of erasing. Drawings can be made beforehand and rolled up to await future reference. Drawings which are rolled from view cannot be destroyed by mischievous pupils. The take-up roll will preserve the work of a long period thus facilitating review lessons.

Two disadvantages of the device are present which detract only slightly from its effectiveness. Newsprint is rather soft and can be easily torn. Masking or drafting tape has been found to be very effective in repairing tears. If the device is carefully made and given reasonable care, few tears will develop. The second disadvantage is concerned with making corrections in drawings on the paper. Since erasing is not possible, it was found that the best way to correct errors is to paste pieces of newsprint over the error and then make the correction on the new surface. If time is at a premium, masking or drafting tape can be used to cover a mistake. The tape does not make as good a repair, however, due to differences in color.

MODEL GRINDER TEACHING AID

JACK F. BINKLEY
Machine Shop Teacher
High School
Redlands, Calif.

The grinding of tool bits, woodworking tools, chisels, and similar tools can be demonstrated very well on this model tool grinder.

This teaching aid will assist the skillful teacher to supplement his instruction on the grinding of tools without going to the real grinder.

The model has several advantages over a real grinder. It is silent and will not distract from the student's attention while the teacher is emphasizing a point of information. The teaching aid is portable and can be moved from place to place. Since it does not run, there will be no danger from steel or emery. The instructor can keep the model in a handy location for instant use.

A discarded emery wheel of small diameter will serve well for the model grinder. The other parts can be made of plywood or pine, glued and nailed together with wire brads.

Here is a suggested list of material:

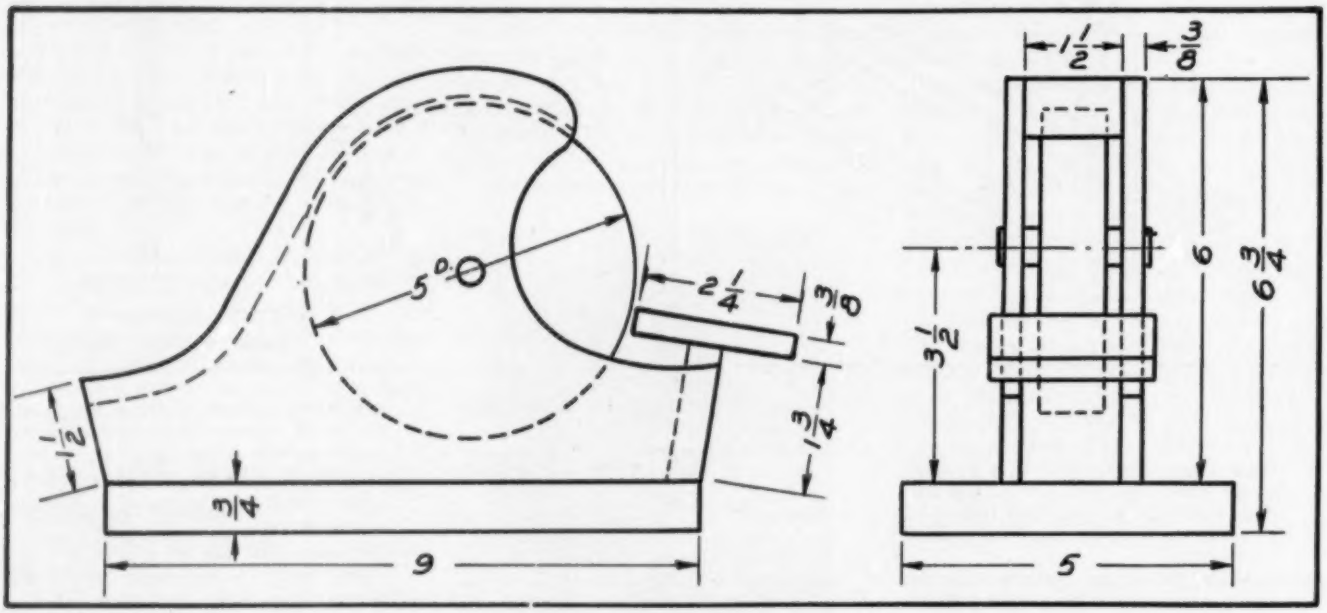
No. req'd	*Material*	*Size*
1	Used emery wheel	About 5 in. in diameter
2	Side pieces	⅜ x 6 x 9¼ in.
1	Top piece	1½ x 6 x 7 in.
1	Arbor — dowel rod	⅝ x 2⅜ in.
1	Tool rest part	¾ x 1½ x 1¾ in.
1	Tool rest part	⅜ x 2¼ x 2½ in.
1	Base	¾ x 5 x 9 in.

A VISUAL OPERATION CHART

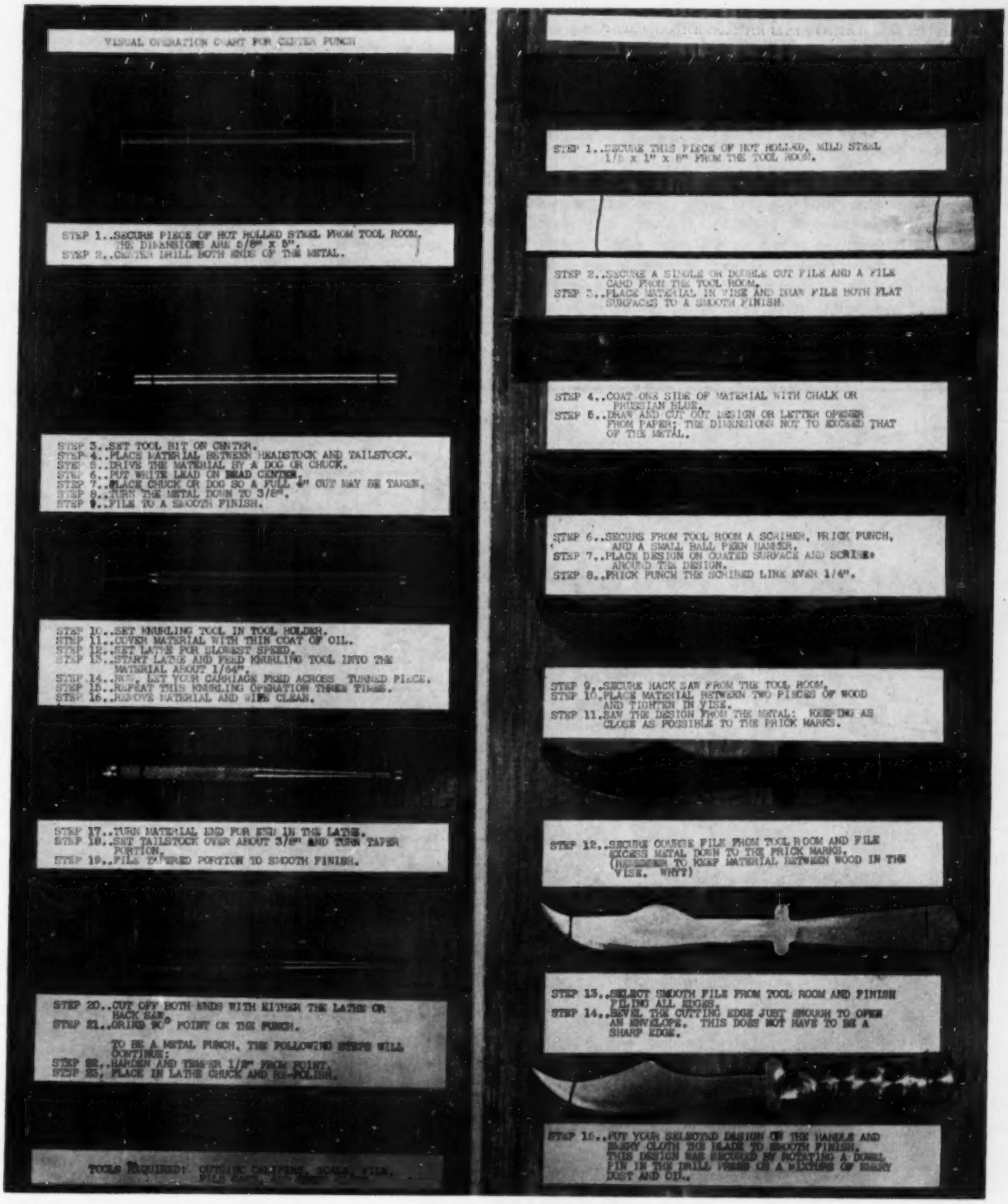
WAYNE COLLINS
Central High School
Hobart, Ind.

Last year I had the problem of acquainting beginning machine-shop students each period of the day with bench and lathe work while at the same time devoting a major portion of my time to the advanced students in my shop. Most beginning students are interested only in what the finished project will look like and how long it will take them to complete the project.

I hit upon the old idea of using a visual chart which contained a breakdown of the



Details of model grinder teaching aid


VISUAL OPERATION CHART FOR CENTER PUNCH
STEP 1..SECURE PIECE OF HOT ROLLED STEEL FROM TOOL ROOM, THE DIMENSIONS ARE 5/8" X 5".
STEP 2..CENTER DRILL BOTH ENDS OF THE METAL.
STEP 3..SET TOOL BIT ON CENTER.
STEP 4..PLACE MATERIAL BETWEEN HEADSTOCK AND TAILSTOCK.
STEP 5..DRIVE THE MATERIAL BY A DOG OR CHUCK.
STEP 6..PUT WHITE LEAD ON HEAD CENTER.
STEP 7..PLACE CHUCK OR DOG SO A FULL 4" CUT MAY BE TAKEN.
STEP 8..TURN THE METAL DOWN TO 3/8".
STEP 9..FILE TO A SMOOTH FINISH.
STEP 10..SET KNURLING TOOL IN TOOL HOLDER.
STEP 11..COVER MATERIAL WITH THIN COAT OF OIL.
STEP 12..SET LATHE FOR SLOWEST SPEED.
STEP 13..START LATHE AND FEED KNURLING TOOL INTO THE MATERIAL ABOUT 1/64".
STEP 14..NOW, SET YOUR CARRIAGE FEED ACROSS TURNED PIECE.
STEP 15..REPEAT THIS KNURLING OPERATION THREE TIMES.
STEP 16..REMOVE MATERIAL AND WIPE CLEAN.
STEP 17..TURN MATERIAL END FOR END IN THE LATHE.
STEP 18..SET TAILSTOCK OVER ABOUT 3/8" AND TURN TAPER PORTION.
STEP 19..FILE TAPERED PORTION TO SMOOTH FINISH.
STEP 20..CUT OFF BOTH ENDS WITH EITHER THE LATHE OR HACK SAW.
STEP 21..GRIND 90° POINT ON THE PUNCH.
TO BE A METAL PUNCH, THE FOLLOWING STEPS WILL CONTINUE:
STEP 22..HARDEN AND TEMPER 1/2" FROM POINT.
STEP 23..PLACE IN LATHE CHUCK AND RE-POLISH.
TOOLS REQUIRED: OUTSIDE CALIPERS, SCALE, FILE,
STEP 1..SECURE THIS PIECE OF HOT ROLLED, MILD STEEL 1/8 X 1" X 6" FROM THE TOOL ROOM.
STEP 2..SECURE A SINGLE OR DOUBLE CUT FILE AND A FILE CARD FROM THE TOOL ROOM.
STEP 3..PLACE MATERIAL IN VISE AND DRAW FILE BOTH FLAT SURFACES TO A SMOOTH FINISH.
STEP 4..COAT ONE SIDE OF MATERIAL WITH CHALK OR PRUSSIAN BLUE.
STEP 5..DRAW AND CUT OUT DESIGN OR LETTER OPENER FROM PAPER; THE DIMENSIONS NOT TO EXCEED THAT OF THE METAL.
STEP 6..SECURE FROM TOOL ROOM A SCRIBER, PRICK PUNCH, AND A SMALL BALL PEEN HAMMER.
STEP 7..PLACE DESIGN ON COATED SURFACE AND SCRIBE AROUND THE DESIGN.
STEP 8..PRICK PUNCH THE SCRIBED LINE EVEN 1/4".
STEP 9..SECURE HACK SAW FROM THE TOOL ROOM.
STEP 10..PLACE MATERIAL BETWEEN TWO PIECES OF WOOD AND TIGHTEN IN VISE.
STEP 11..SAW THE DESIGN FROM THE METAL; KEEPING AS CLOSE AS POSSIBLE TO THE PRICK MARKS.
STEP 12..SECURE COURSE FILE FROM TOOL ROOM AND FILE EXCESS METAL DOWN TO THE PRICK MARKS. (REMEMBER TO KEEP MATERIAL BETWEEN WOOD IN THE VISE. WHY?)
STEP 13..SELECT SMOOTH FILE FROM TOOL ROOM AND FINISH FILING ALL EDGES.
STEP 14..BEVEL THE CUTTING EDGE JUST ENOUGH TO OPEN AN ENVELOPE. THIS DOES NOT HAVE TO BE A SHARP EDGE.
STEP 15..PUT YOUR SELECTED DESIGN ON THE HANDLE AND EMERY CLOTH THE BLADE TO SMOOTH FINISH. THIS DESIGN MAY BE ETCHED BY ROTATING A DULL PIN IN THE DRILL PRESS IN A MIXTURE OF EMERY DUST AND OIL.

A visual operation chart

project step by step, together with an explanation of how each step was to be accomplished. By using these charts I have cut my instruction time for the beginning student in half.

Each of these two projects pictured will take an average student about two weeks to complete, and when he leaves my shop, I feel that he will have received as much machine-shop practice as is possible in the amount of time available. All that is needed with this visual operation chart is some simple explanation of the tools required and their uses. I find that most of the beginning students, after taking this short course, desire to take machine shop vocationally.

In 1950, 9400 pedestrians were killed in the United States.

SPUN METAL DESK LAMP

L. B. HARDEMAN

Assistant Professor
Industrial Education Department
A. & M. College of Texas
College Station, Tex.

Although metal spun projects require the preliminary preparation of chucks, if they are well planned, they can be used again and again to make the same project or in a variety of combinations to make different projects.

For example, the base to one design of lamp can be used for another style, or even for another project.

The base of the lamp pictured takes the same chuck that was used to form the planter lamp bowl and the fruit bowls of the balance scales, both shown in previous issues of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine.

The shade of this desk lamp may appear difficult to spin, but if the correct procedure is followed it will be quite easy. It should not be attempted without the use of at least three backing pads as shown in Figure 1. Also, a backing stick will aid in keeping out the edge wrinkles. The only spinning tools used on this project were two hickory sticks and a large file that had been sharpened to a chisel shape on the end for trimming the edge.

The bill of material of the lamp is as follows:

Amount Req'd	*Description of Material*
1	11-in. dia. .050-in. soft aluminum
1	8¼-in. dia. .050-in. soft aluminum
3 lb.	Lead or body solder
1	15-in. piece of ¼-in. standard pipe
1	¼-in. pipe nut
2	⅜-in. dia. by ½-in. all thread pipe nipples
1	⅛ by ¾ by 3½-in. strap iron
1	Keyless light socket
1	Small rotary or push switch
8 ft.	Lamp cord
1	Plug with prongs
1	⅛-in. lamp swivel

With these same two spinnings, one can make other lamp arrangements. For example, by using a short stem, say 2 in. long in connection with the spun shade and base, a very attractive pin-up or bed lamp can be made. The pin-up type may also be used as an entrance light as shown in Figure 3.

The spun shade may be used in groups of two or three on a floor lamp.

The following steps suggest an efficient and easy plan of procedure.

1. Select hardwood stock for spinning chucks and backing pads. See Figure 1. Hard maple chucks are very satisfactory; however, cast aluminum chucks are much more durable.

2. Fasten the chuck stock securely in the lathe faceplate and turn it to the size and shape shown in Figure 1.

3. Turn the backing pads to the size shown in Figure 1. They should be of hardwood also, as the hollow ones will receive considerable pressure which may cause them to split. The backing pads should have good pressure against the chuck around the outer rim to minimize the spring back of the spinning.

4. Cut one disk of 8¼-in. diameter, and one of 11-in. diameter from .050-in. or .064-in. soft aluminum.

5. Center the 8¼-in disk of aluminum between the base chuck and the 1¼-in. backing pad.

6. Apply pressure with a spinning tool (hickory stick preferable) around the center and work out to a distance of about 2½-in. from the center.

7. Remove the small backing pad and insert the 5-in. saucer shaped pad.

8. Recenter the disk and complete the spinning as

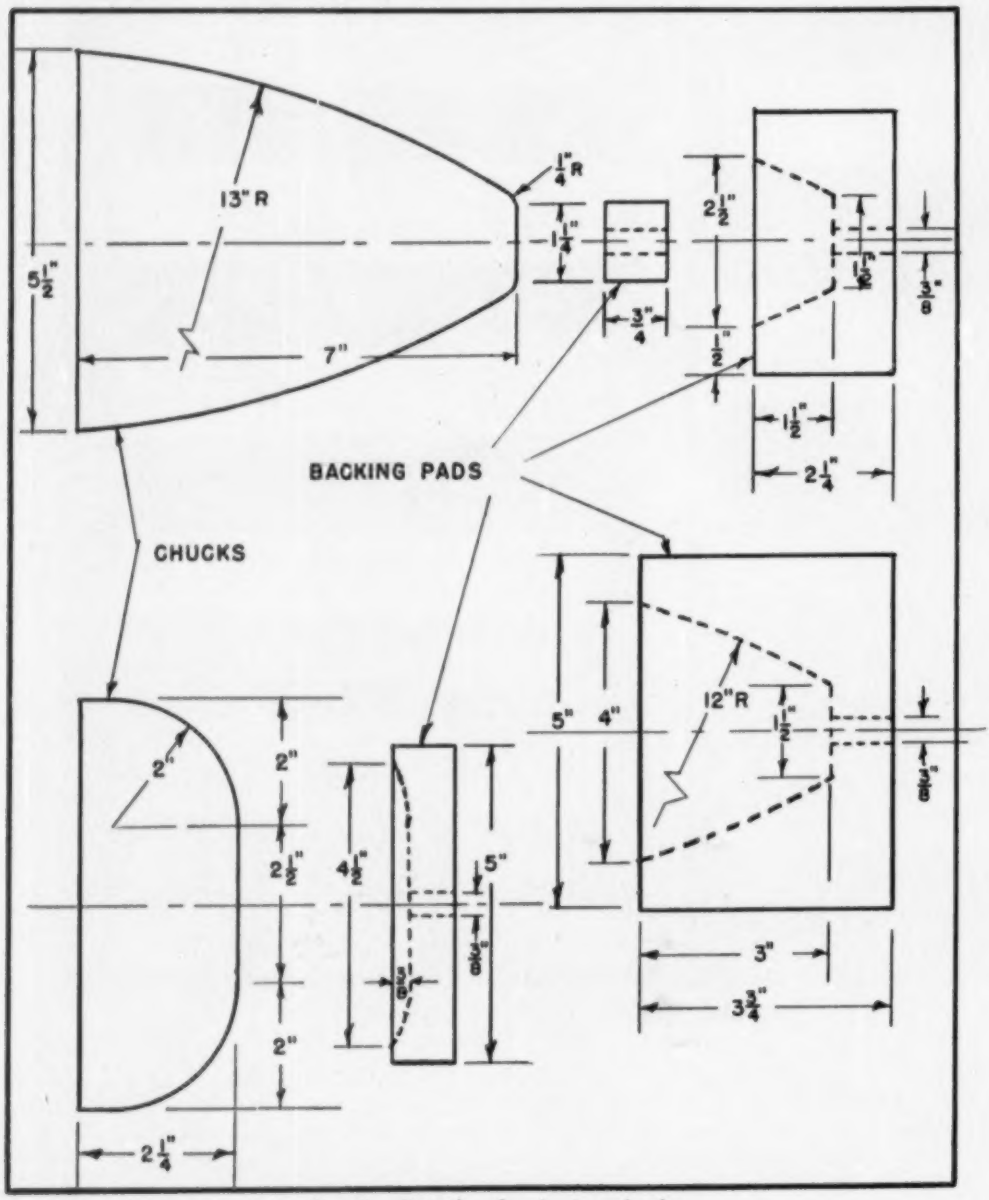


Fig. 1. Details of spinning chucks

shown. You may not wish to turn the bead on the rim in case it is to be used as a pin-up or entrance light, shown in Figure 3.

9. Use 3/0 sandpaper to obtain an even smooth surface.

NOTE: When sanding on aluminum, a better finish is obtained if beeswax is applied liberally to the sandpaper in order to keep the grit from rolling.

10. Set up the lathe using the lamp shade chuck.

11. Center the 11-in. disk on the chuck and use the 1¼-in. backing pad to hold it in place and apply beeswax to lubricate.

12. "Set" the disk to the chuck by spinning for a depth distance of about ⅜ in.

NOTE: Do this by using two or three short inward strokes and applying firm, quick pressure. From here on it will be necessary to use two spinning tools, one to push the metal ahead and the other to support the disks.

13. Spin to a depth of about 1 in. along the chuck. If the disk breaks out around the backing pad it is indication that progress has been too slow or the supporting tool is being used incorrectly.

14. Remove the small backing pad and insert the smallest cup-shaped one.

15. Progress with the spinning until the large cup-shaped backing pad can be inserted.

16. Insert the large cup-shaped pad and finish the spinning.

NOTE: When spinning a deep project you should progress as fast as possible and use mostly inward strokes. Too much playing around with the metal will cause it to harden more and also crack around the backing pads. If wrinkles occur, "pinch" them out with the two spinning tools at once. If too much unevenness develops on the radius, trim it with the trimming tools.

17. Sand with 3/0 sandpaper to a smooth even finish.

18. Buff the spinnings to a high luster if it is desired, although the sanded effect is very attractive.

19. Cut a piece of ¼-in. pipe 15 in. long, as shown in Figure 2.

20. Thread one end with ¼-in. standard pipe thread for a distance of 1 in.

21. Tap ⅛-in. pipe thread in the other end.

22. Place it in the lathe and file to a bright smooth finish, and polish with fine emery cloth.

23. Bend the ¼ by 15-in. pipe in an arc with about a 7½-in. radius.

24. Place the base spinning in an inverted position and resting at approximately 10-deg. angle in fine wet sand.

25. Melt three pounds of lead and pour into the base. Care should be taken so the lead is no hotter than absolutely necessary as it will discolor or even melt the aluminum.

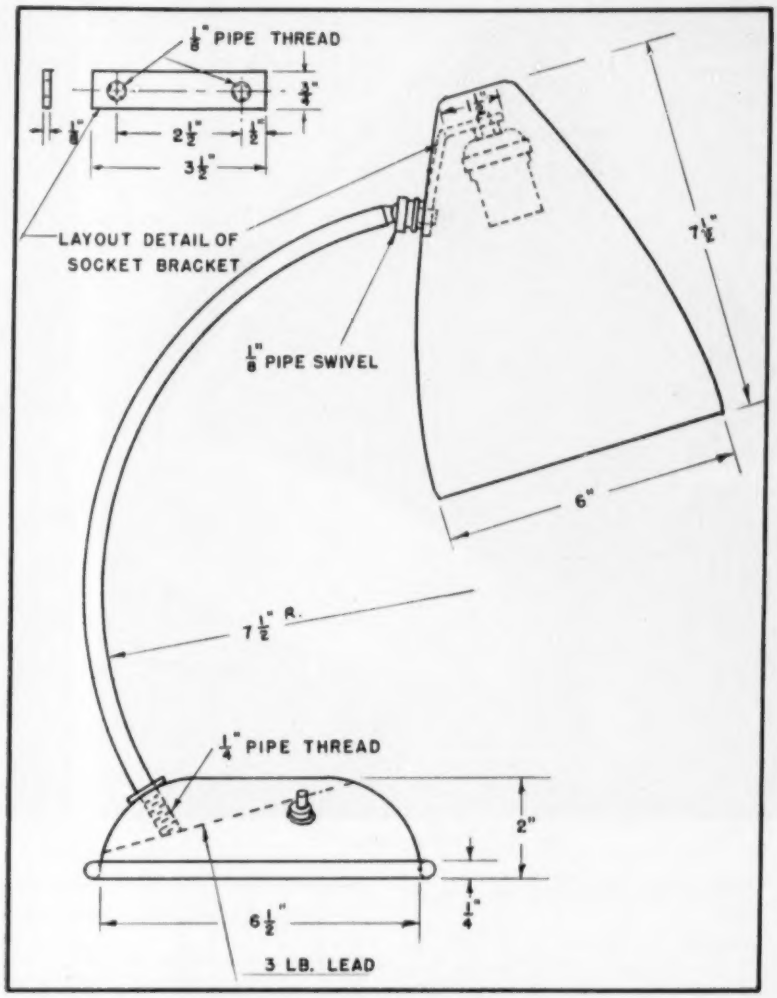


Fig. 2. Details of desk lamp

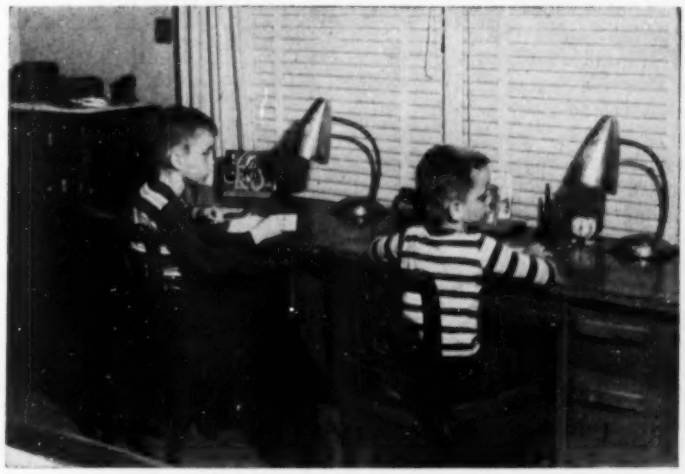


Fig. 4. Desk lamps in use

26. Cut a piece of ⅛ by ¾ by 3½-in. strap iron. See Figure 2.

27. Drill 11/32-in. holes ½ in. from each end.

28. Tap both holes with ⅛-in. pipe tap.

29. Bend strap iron as shown.

30. Locate and drill 13/32-in. hole in shade.

31. Locate and drill holes in the base for the wire, switch, and column.

32. Locate the hole in the lead by placing it under the base and marking.

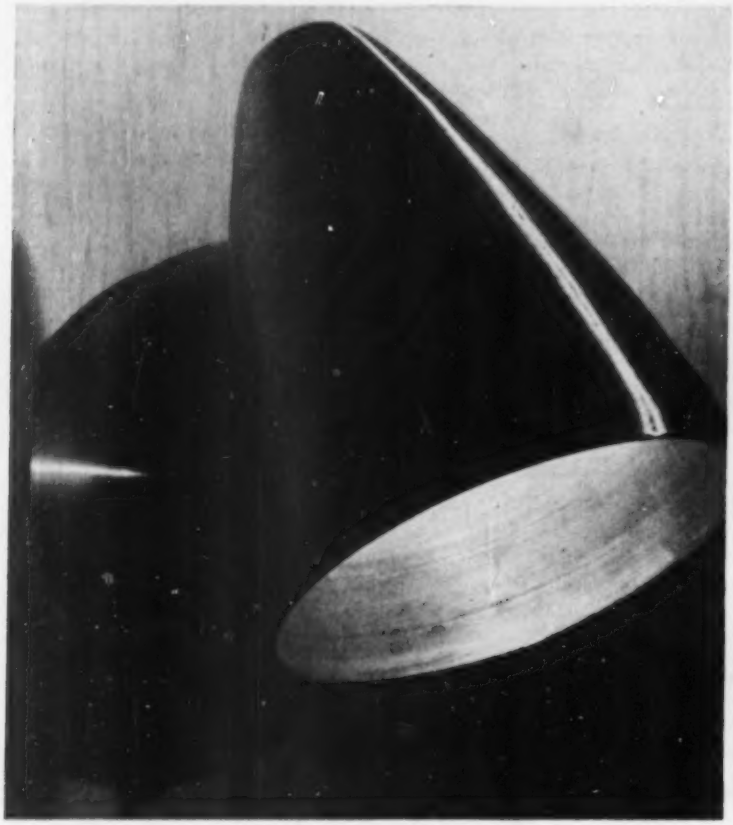


Fig. 3. Pin-up lamp

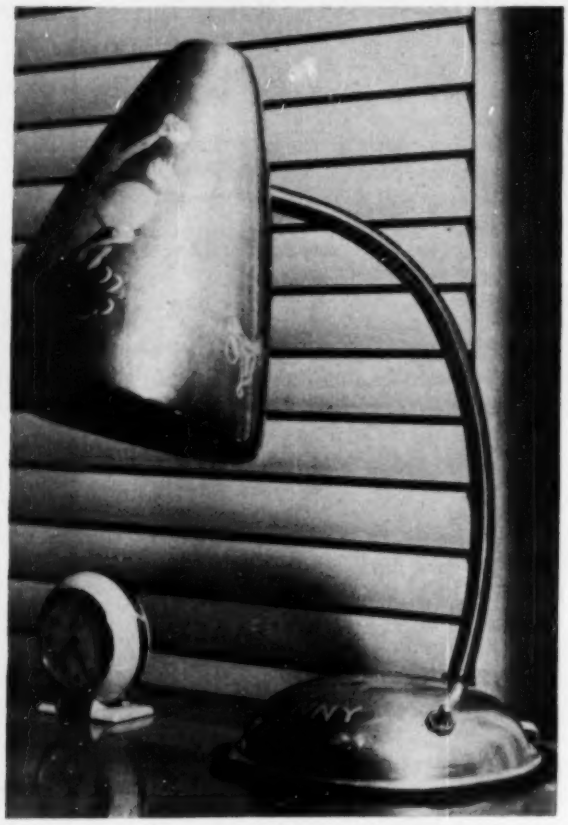


Fig. 5. Etched desk lamp

33. Drill and tap ¼-in. pipe thread in the lead weight.

34. Assemble by screwing ¼-in. pipe nut on the column; insert column through base spinning, and screw into lead weight until tight against nut.

35. Fasten switch into base.

36. Fasten light socket cap to strap iron with ⅛ by ½-in. pipe nipple.

37. Assemble the socket bracket, lamp shade, and swivel by using a ⅛ by ½-in. pipe nipple as shown in Figure 2.

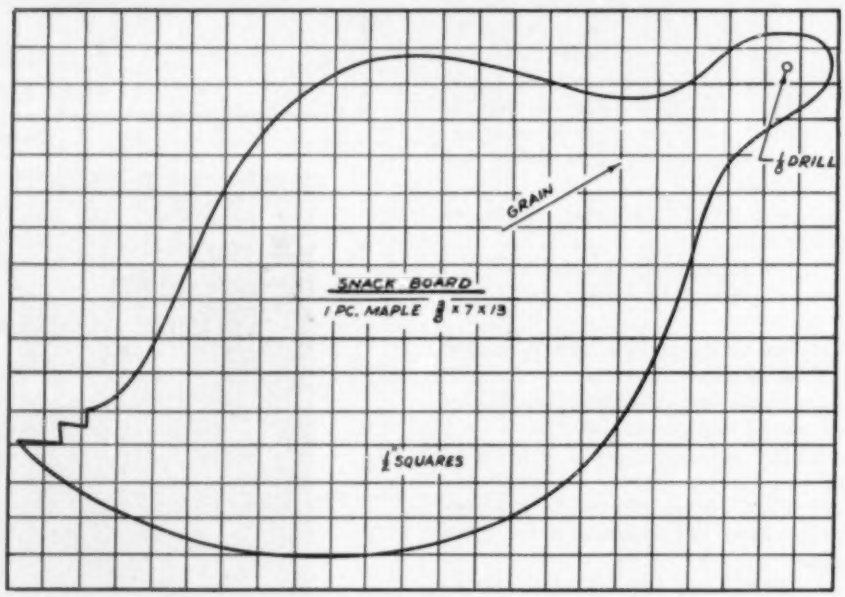
38. Screw shade assembly to the column.

39. Wire the lamp and test.

40. Wipe the lamp clean and spray with clear metal lacquer.

If the lamp (Fig. 5) is to be used in unique settings such as a den or boys' room it is very attractive to etch designs or a name on the shade and base.

The swivel, keyless socket, and other lamp accessories may be obtained from any lamp supply house.



Snack board designed by Arthur C. Wenzel

THE SNACK BOARD

ARTHUR C. WENZEL
State Teachers College
California, Pa.

The snack board is a projcct which is easy to make, and one that does not take up too much time. It is a handy item at snack time, lunch time, or when friends drop in for a visit.

A companion bread or cutting board may be made in the same design by increasing the size to ⅝ by 8 by 15½ in.

Tools: Hand plane, coping or jig saw, cabinet file, twist drill, hand drill, and a small paint brush.

Procedure

1. Secure stock, check and plane true to ⅜ thickness for snack board or ⅝ thickness for companion bread board.

2. Make full size pattern and trace on stock.

3. Cut out design with coping saw or jig saw.

4. Remove saw marks with cabinet file.

5. Locate and drill hole for hanging.

6. Sand edges and surfaces smooth with 1/2, 3/0, and 6/0 garnet sandpaper.

7. Select enamel and apply to edge of design.

8. Check the job after the enamel has dried and clean with smooth sandpaper if necessary.

BILL OF MATERIALS

No. of pcs.	*Name*	*Material*	*Size*
1	Snack board	Maple	3/8 x 7 x 13
1	Companion board	Maple	5/8 x 8 1/2 x 16
	Sandpaper and appropriate enamel		

PLASTIC WINDSHIELD SCRAPER

MERLIN MOORE
Industrial Arts Instructor
High School
Washburn, Wis.

One of the major problems of the general comprehensive shop teacher is that of having a variety of elementary projects readily available for students to use in each area of instruction. These projects must satisfy a great number of requirements. They must not only embody many basic operations or problems but must also be reasonable in price, be worth while when evaluated by the students, and be of practical value when they are completed.

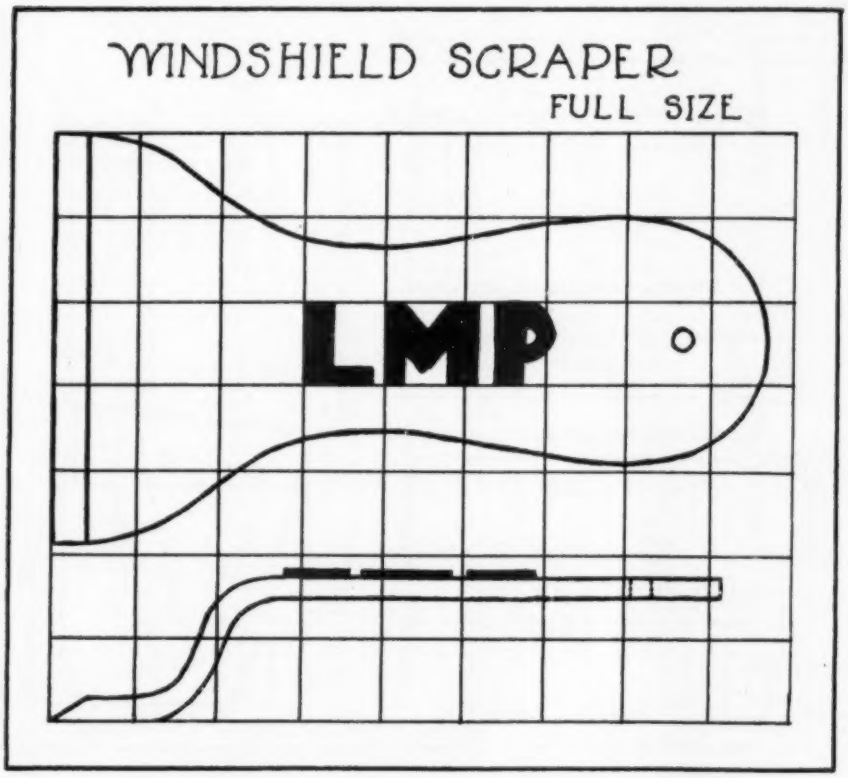
The windshield scraper which is portrayed here meets the above requirements very well. It has been used with considerable success as one of a series of elementary projects in the plastics area. The method of procedure can be modified if one wishes to meet the needs of a particular situation or if one wishes to deviate from the idea of having students perform numerous basic operations which do not really contribute to the actual value of the finished project.

BILL OF MATERIAL

1 pc. acrylic plastic 1/8 x 2 1/2 x 4 1/4
3 pcs. acrylic plastic 1/16 x 5/8 x 1/2

Procedure

1. Lay out pattern for scraper and student's initials.
2. Transfer patterns to acrylic plastic.
3. Cut out with jig or coping saw.
4. File edge of scraper as shown.
5. Sand and polish the edges.
6. Drill 1/8-in. hole.
7. Heat and bend as illustrated.
8. Tint scraper if desired.
9. Cement initials to scraper.
10. Apply wax and polish.
11. Attach key chain.



PORTABLE DRAWING DESK

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and
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Santa Barbara, Calif.

In all laboratory courses, careful planning should precede the actual construction of a project. However, to expect a student to set up plans before he knows how to operate the numerous woodworking machines is expecting too much. Such first plans should be preliminary plans, sufficiently elaborate to make construction possible. After receiving instruction in the use of machines, a student will be able to set up his plans in a more detailed form, incorporating correct operational procedure and techniques.

The following set of plans is typical of those prepared in our first course in machine woodworking. In addition to showing in step-by-step procedure how the project should be made, each student has ample opportunity to show his drawing ability.

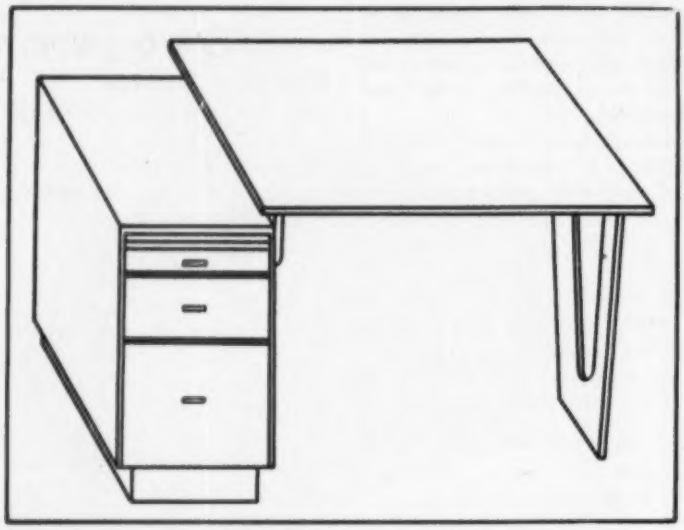
Planning the Project

In many situations, especially in the modern home, the ordinary drawing table and high stool does not harmonize with conventional furniture. In most homes there is no place for a large drawing table unless it would fit into some convenient alcove. In addition to these problems, there is the need for convenient storage for drawing materials, instruments, reference books, and for storing finished and unfinished work.

It is the purpose of this project in woodworking to design a drawing table that will take care of the requirements stated in the foregoing, and at the same time make it so that it can be transported easily. A maximum of efficiency and attractiveness should be aimed at. The method used here of having the drawing table detachable so that it can be easily stored against the wall in some closet, and the file section small enough to fit in a small space seems to fill the needed requirements, e.g., portability, attractiveness, efficiency, and convenience.

Selecting the Material

The material selected for this piece of furniture should harmonize with the furniture of the room in which it is to be placed. The author has selected knotty pine which will be finished natural for both harmony and economy. The material should be No. 2 kiln dried lumber or better with knots that are not too big and that are tight. See bill of material.



Portable drawing desk

Kind of Material	*Size*
California sugar pine	47 lin. ft. 1 x 8 No. 2
California sugar pine	26 lin. ft. 1 x 6 No. 2
California sugar pine	20 lin. ft. 1 x 4 No. 2
Fir plywood	¼ in. x 24 x 72 in.
Birch plywood	⅛ in. x 24 x 72 in.

Hardware

No. of Pcs.	*Name*	*Size*
6	Metal glides	
3	Drawer pulls, colonial	
6	Carriage bolts with wing nuts	¼ x 2 in.
4	Concealed head bolts with wing nuts	¼ x 2 in.
3	Stove bolts with wing nuts	¼ x 1½ in.

Rough Plan of Procedure

1. Purchase material as per lumber list.
2. Lay out and cut to size material for top, bottom, and sides of file section.
3. Lay out and cut to size material for drawing board leg.
4. Surface, joint, and glue up file case and leg material.
5. Lay out and machine parts for drawers.
6. Lay out and machine parts for drawing board braces.
7. Lay out, cut, and glue up drawer glides.
8. Machine and assemble file case.
9. Lay out and cut toe plate.
10. Assemble and fit drawers.
11. Install toe plate.
12. Assemble and install drawing board, braces, leg, and hardware.
13. Sand and fill.
14. Seal and lacquer.

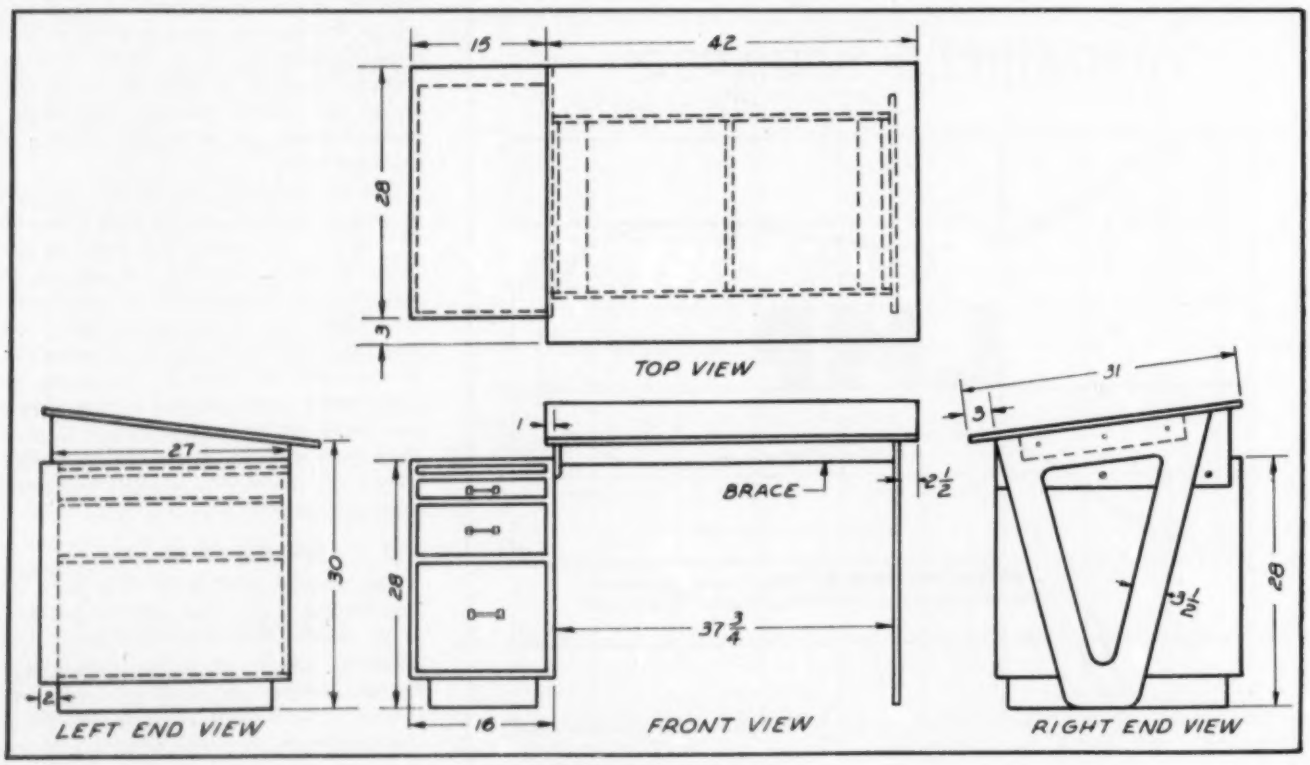
FILE SECTION PROCEDURE

Cutting List

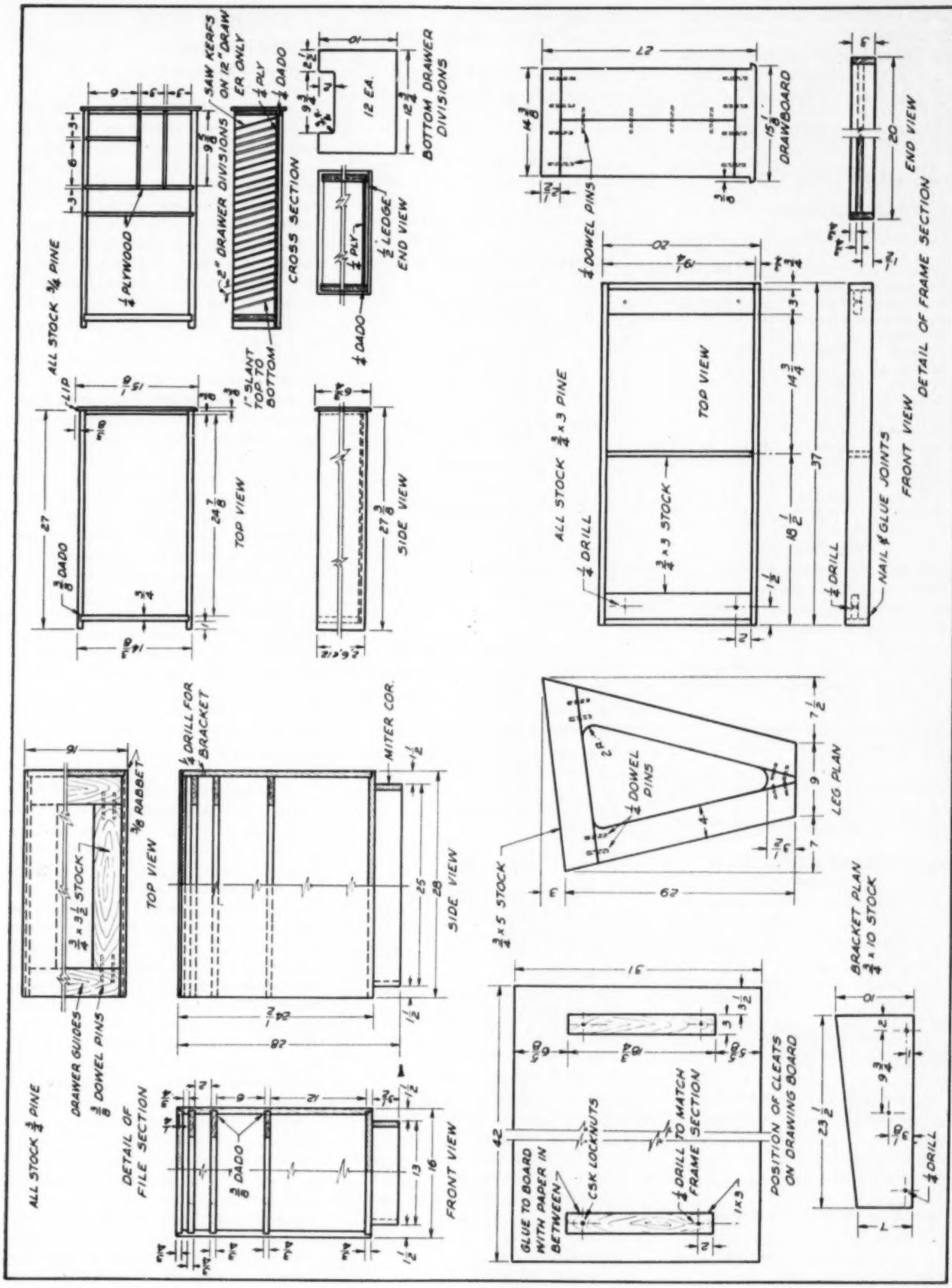
No. of Pcs.	*Name of Part*	*Material*	*Size*
8	Sides of cabinet	Pine	1 x 8 x 26
8	Top and bottom of cabinet	Pine	1 x 8 x 18
2	Back of cabinet	Pine	1 x 8 x 25
6	Drawer guides	Pine	1 x 4 x 15
6	Drawer guides	Pine	1 x 4 x 20½
2	Toe plate	Pine	1 x 4 x 12
2	Toe plate	Pine	1 x 4 x 24

Procedure

1. Cut pieces to size as shown on cutting list, joint and glue together to make: 2 panels, 24 by 28-in., 2 panels 16 by 28 in. and 1 panel 16 by 24 in. Note that cutting list sizes allow for trimming to aforementioned sizes.
2. Cut and glue together with dowels the three drawer guides.



Portable drawing desk



Details of portable drawing desk

3. Cut toe plate to size, miter corners and glue and nail together.

4. Trim all glued panels and drawer guides to size, joint edges and plane surfaces smooth.

5. Cut dadoes and rabbets and assemble with glue.

6. Nail and glue toe plate to bottom of file section.

7. Rough sand with 2/0 garnet paper.

DRAWER PROCEDURE

Cutting List

No. of Pcs.	*Name of Part*	*Material*	*Size*
2	Pencil drawer	Pine	1 x 2 x 27
1	Pencil drawer	Pine	1 x 1½ x 13½
1	Pencil drawer	Pine	1 x 2 x 14½
2	Instrument drawer	Pine	1 x 6 x 27
1	Instrument drawer	Pine	1 x 6 x 14½
1	Instrument drawer	Pine	1 x 5½ x 13½
2	File drawer	Pine	1 x 12 x 27
1	File drawer	Pine	1 x 12 x 14½
1	File drawer	Pine	1 x 11½ x 13½
3	Drawer bottom	Plywood	¼ x 13½ x 26
12	Division	Plywood	⅛ x 12¾ x 10

Procedure

1. Cut pieces for complete drawers.

2. Dado and rabbet as shown.

3. Bullnose fronts of drawers on shaper.

4. Cut saw grooves on sides of bottom drawer as shown.

5. Cut division dadoes for pencil drawer.

6. Cut divider pieces from ¼-in. plywood scraps.

7. Nail and glue drawers together.

8. Fit drawers and draw board to file section.

9. Install hardware, and then remove it for finishing.

10. Cut, sand, and install divisions.

BRACKET, LEG, AND DRAWING BOARD

Cutting List

No. of Pcs.	*Name of Part*	*Material*	*Size*
2	Leg	Pine	1 x 4 x 36
1	Leg	Pine	1 x 4 x 20
1	Leg	Pine	1 x 4 x 8
2	Drawing board cleats	Pine	1 x 4 x 18½
1	Bracket	Pine	1 x 8 x 27

Procedure for Leg

1. Cut pieces to size as shown on cutting list.

2. Joint, glue, and dowel as shown.

3. Lay out arcs on assembled leg and cut out on jig saw.

4. Drill holes for brace bolts.

5. Rough sand with 2/0 garnet.

Procedure for Drawing Board

1. Purchase a 31 by 42-in. drawing board.

2. Cut pieces to size as shown on cutting list to match coinciding frame pieces.

3. Drill holes to match frame piece holes.

4. Set prong-headed anchor nuts into pieces as shown on plan.

5. Glue to stock drawing board with a good grade of paper between pieces and board for easy removal.

Procedure for Bracket

1. Cut and drill bracket as shown on plan.

2. Sand both ends oval.

3. Joint and sand with 2/0 garnet.

DRAWBOARD AND SUPPORT FRAME

Cutting List

No. of Pcs.	*Name of Part*	*Material*	*Size*
2	Drawboard	Pine	1 x 8 x 24
2	Drawboard splines	Pine	1 x 2½ x 16
5	Support frame	Pine	1 x 4 x 18½
2	Support frame	Pine	1 x 4 x 37

Procedure for Drawboard

1. Cut pieces to size as shown on cutting list, lay out and drill for dowels.

2. Joint, glue, and clamp.

3. Cut splines for ends and dowel and glue to ends of board.

4. Trim to size and cut to width, allowing ½ in. for *ears* on face end.

5. Sand ears round and rough sand surfaces with 2/0 garnet.

Procedure for Support Frame

1. Cut pieces to size as shown on cutting list, nail and glue together as shown on plan. Set all nail heads.

2. Drill holes as indicated on plan.

3. Drill holes for pieces to glue on drawing board simultaneously with matching members on support frame.

4. Sand exposed surfaces only, use 2/0 garnet.

FINISHING

Procedure for Finishing

1. Scrape all glue joints smooth and sand all exposed surfaces with 2/0 garnet.

2. Fill all nail holes and knot holes with clear stick shellac.

3. Sand all exposed surfaces smooth and free of cross scratches, pencil marks, and other blemishes with 6/0 garnet paper.

4. Seal with sanding sealer and sand smooth with 9/0 garnet paper.

5. Apply 4 to 6 coats of lacquer, sanding lightly any rough spots between each coat.

6. On finish coat, handrub with 7/0 Wet-or-dry or Speed-wet sandpaper and a mixture of kerosene and machine oil.

7. Finish rubbing with lacquer rubbing compound.

8. Wax and polish.

9. Install all hardware.

10. Assemble all units.

CARBON TOOL STEELS

LESTER F. SPENCER

Kensington, Conn.

The carbon tool steels are the oldest type of steels that are used for the cutting of metals, and, in spite of the many advances that have been made in both composition and manufacture of the many varieties of alloy steels that are on the market today, the carbon tool steel grades still play a vital role in American industry. The advantages that accompany the use of a carbon tool steel are lower cost, easy machinability when annealed, and the fact that the material hardens with a comparatively hard outside surface and a softer interior.

The carbon tool steels have as their most influential element, carbon, the content of which determines not only the method of heat treatment, but also the use of the material. Carbon tool steel also contains varying percentages of manganese, silicon, sulphur, and phosphorus. The manganese is important in that a good depth hardness can be obtained and it is the relationship between the carbon and the manganese that determines whether the carbon tool steel can be quenched in either water or oil. The manganese plays another role in that it tends to offset the bad influence of sulphur, this last mentioned element being both undesirable and an unpreventable element within the composition. Silicon is also an element that occurs in a tool analysis. Its function is that it acts as a deoxidizer and combines with oxygen during the melting process and thus enables the tool steel to be free of this undesirable element.

Specifying a Tool Steel

Tool steel manufacturers usually have three or four grades of tool steel — one being the best grade; the next is second best, and so forth. The reason for these various grades is that the carbon tool steels are in a very competitive field in regard to price, and the purchaser may not require a high grade carbon tool steel for his purpose. On the other hand, a better grade of carbon tool steel may be required and in this event, the manufacturer has to assure the purchaser that the material that is to be purchased is of good quality. Thus, for example, Manufacturer X has four grades, *A*, *B*, *C*, and *D*, of carbon tool steel. The following would illustrate the method of grading.

Type A (Supreme Grade). This composition carbon tool steel will be furnished according to the customer's specification and will be sold with a guaranteed surface hardness and depth hardness between two standards established by specification in accordance to the Shephard Fracture Test. Each bar is examined by an acid etch to determine the soundness of the steel before shipment and the

grain size is specified and guaranteed when a specified heat treatment is followed.

Type B (Superior Grade). This composition tool steel is of second quality, and conditions in this grade are similar to that of Grade A with the exception that it is not made to a customer's specification, nor is the range in surface hardness or depth hardness guaranteed.

Type C (Good Grade). This composition tool steel is the third quality. It is not made according to customer specification, and acid etch for the determination of the soundness of the bar stock is not made. Depth hardness or surface hardness is not guaranteed either.

Type D (Mill Grade). This composition tool steel is the lowest quality and there would be no manufacturer service on this grade with the exception that occasionally a bar would be fractured to determine whether there is any large internal defect such as pipe or porosity.

Since the carbon content determines the physical properties and the ultimate use of the tool steel, it is necessary to specify a carbon range. In industry, the specification of the carbon range is done by means of temper numbers, and the particular method of temper number designation is up to the manufacturer. Usually each manufacturer has his own method of temper designation as is illustrated in Table 1 where 5 manufacturers and their temper numbers are listed. Manufacturers A and B have a simplified correlation between temper numbers and carbon ranges. Thus, a temper of 9 is multiplied by a factor .10 to obtain the carbon content of .90 per cent; manufacturer C uses the factor .20; whereas both manufacturers D and E have no correlation between these two factors whatsoever.

Heat Treatment

S.A.E. 1070

Chemical Analysis:

Carbon	0.65–0.70 per cent
Manganese	0.60–0.75 per cent
Silicon	0.50 per cent

1. Select a section that is approximately 1 in. in diameter by 3 in.

2. Grind the steel section so as to remove any surface effect such as a decarburized zone which may have been present due to mill practice.

3. Obtain a Rockwell hardness so as to obtain a reading for further comparison with the hardened section.

4. Place directly into the furnace which is being controlled between 1475 and 1500 deg. Allow sufficient time for the specimen to heat thoroughly from edge to center.

5. Quench directly into oil, stirring vigorously.

6. Clean, and obtain a Rockwell hardness reading.

7. Grind the surface so as to remove any effect of surface decarburization that may have taken place during the hardening operation.

8. Rockwell the section again. If there is an increase in hardness, the hardening heat had an effect on the surface of the steel. If the Rockwell hardness remains the same, there has been no reaction at the hardening temperature.

9. Temper as desired, and obtain Rockwell hardness.

TABLE 1. Temper Numbers

Carbon Range Per Cent	Manufacturer					
	A	B	C	D	E	
0.45 to 0.50					D	
0.51 to 0.55						
0.56 to 0.60					G	
0.61 to 0.65				E		
0.66 to 0.70	7	7½			H	
0.71 to 0.75				F		
0.76 to 0.80	8	8			K	
0.81 to 0.85		8½	4	G		
0.86 to 0.90	9	9			N	
0.91 to 0.95		9½	4½	H		
0.96 to 1.00	10	10				
1.01 to 1.05		10½	5	J		BB
1.06 to 1.10	11	11				
1.11 to 1.15		11½	5½	K		
1.16 to 1.20	12	12				
1.21 to 1.25		12½	6	L		
1.26 to 1.30	13	13				
1.31 to 1.35		13½	6½			
1.36 to 1.40	14					
1.41 to 1.45						

Thus the same procedure can be carried out with the various carbon grades. The temperatures that can be employed for hardening the other carbon steels are as follows:

Steel	*Hardening Temperature*
0.70% carbon	1475–1525 deg.
0.80% carbon	1435–1475 deg.
0.90% carbon	1425–1475 deg.
1.00% carbon	1400–1450 deg.
1.10% carbon	1400–1435 deg.
1.20% carbon	1390–1425 deg.

The tempering operation that had been stated is a reheating operation to temperatures from 300 to 750 deg. and higher, the purpose of which is to relieve stress set up in the hardening or to lower the hardness and increase shock resistance. The tempering temperature is dependent upon the use of the tool steel. A very interesting study can be made by varying the tempering temperature of a tool steel composition such as a 0.90 per cent carbon, correlating the tempering temperature with the physical properties that are obtained. Thus, such properties as hardness which will be lowered by the tempering temperature, the tensile strength and the yield point, both of which will fall in value as the tempering temperature is raised, and the elongation and reduction in area values obtained in the tensile test which will raise as the tempering temperature is raised.

Metallurgically speaking, the carbon ranges are spoken of as points, thus, a 0.90 per cent carbon steel is known as a 90 point carbon steel, and a carbon steel containing 1.20 per cent carbon would have 120 points of carbon. This merely means that 1 point = .01 per cent.

Manganese is quite important and this element rates second in importance to carbon as a control factor in a carbon tool steel analysis. The manganese content increases depth hardening, and also, causes grain coarsening upon prolonged heating, thus increasing the brittleness of the carbon tool steel and the tendency for the steel toward cracking upon quenching from the hardening temperature. Thus, the manganese content should be lower on the high carbon tool steels, say a 0.30 per cent maximum on carbon steels with 0.90 per cent carbon and over. On

carbon steels containing less than 0.90 per cent carbon, the manganese content can be approximately 0.60 per cent.

Silicon has no influence when the content of this element is below 0.50 per cent. Both sulphur and phosphorus as impurities should be kept as low as possible, preferably .025 per cent maximum.

Behavior of Carbon Tool Steels

The two principal characteristics that may differ from heat to heat not only of material made by different manufacturers, but also when made by the same manufacturer are:

1. The tendency for the tool steel toward grain growth on heating to temperatures from 1450 to 1650 deg. This is undesirable since the larger grain growth will increase the tendency for the steel to become brittle and crack when quenched.

2. The hardness penetration or the tendency for the steel to harden with a deep, or medium, or even shallow depth will vary.

This tendency for grain growth as the temperature rises is illustrated in Figure 1. The material as represented is a 1.0 per cent carbon tool steel, the coarse grain steel definitely coarsening in grain as the temperature is increasing, whereas, the fine grained steel has altered very little in grain size as the temperature is increased. Another observation is that the coarse grain steel has a greater tendency to harden deeper than the fine grained steel. A good method to utilize in experimental hardening in the classroom to determine grain size and depth of hardness penetration is to perform the following steps:

1. On a steel that is to be fractured, cut a nick approximately ⅛ of the diameter of the bar. A good size section would be 1 inch in diameter and about 3 inches long.

2. Place the steel section in the hardening furnace and allow it to come up to the required heat. It is best to have a furnace which has a temperature control such as a pyrometer so that the temperature of test remains constant.

3. Quench this section in water.

4. Fracture by a well-placed blow from a hammer while the section is held firmly on an anvil.

Examine the fracture.

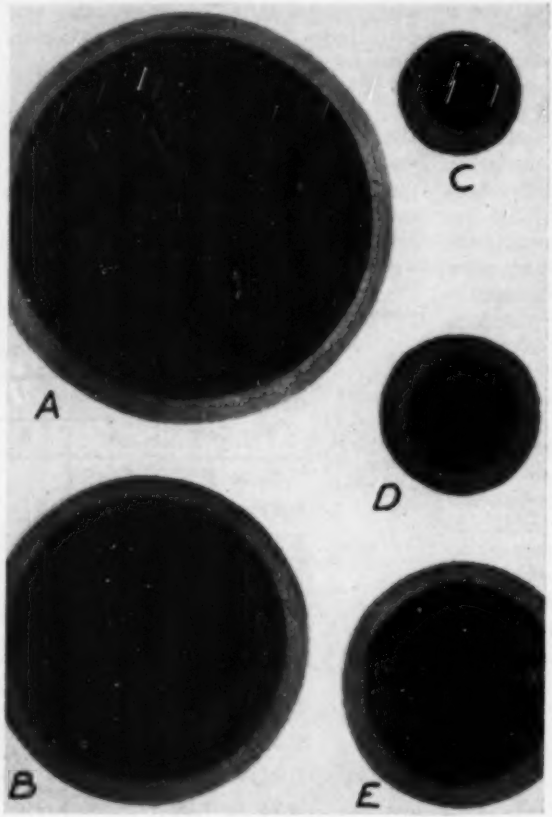
Depth hardness is an important consideration where the diameter of the steel section is rather large. Thus, on a ¾-in. diameter section such as is illustrated in Figure 2, the depth hardness is very satisfactory, and sufficient case (depth harden zone) is obtained for ordinary purposes. The ratio of case to core (unharden zone) is also satisfactory and a tool of this dimension can be reground frequently without too much loss in hardness or service efficiency. However, in the case of the 2½-in. diameter section, the case depth is the same as in the smaller section but the ratio between the harden case and the core may be too extreme. It may then be necessary to specify a deep hardening carbon tool steel to obtain a greater depth hardness, and if this cannot be accomplished to a sufficient degree, it may be necessary to use an alloy steel that has more inherent depth hardening characteristics. It must be kept in mind that the extent of depth hardness that is required is entirely dependent upon the application of the particular tool.

Another method of determining depth hardness is by the use of a nital etchant. The following procedure is employed:

1. The hardened steel section which may be up to 1 inch in diameter and 3 inches long is cut in half (lengthwise) by a high speed cutoff wheel.

2. Either section may be taken and polished on successively fineness of metallographic emery. A smoothing operation may be performed on the grinder to level the section and

(Continued on page 18A)



Medium depth hardening 1.0% carbon tool steel

A
Diameter ..... 2½"
Chill penetration ..... 14/128"
Chill Rockwell C68
Core Rockwell C37

B
Diameter ..... 2"
Chill penetration ..... 15/128"
Chill Rockwell C68
Core Rockwell C38

C
Diameter ..... ¾"
Chill penetration ..... 18/128"
Chill Rockwell C68
Core Rockwell C44

D
Diameter ..... 1"
Chill penetration ..... 17/128"
Chill Rockwell C68
Core Rockwell C42

E
Diameter ..... 1½"
Chill penetration ..... 16/128"
Chill Rockwell C68
Core Rockwell C40

— Courtesy of Bethlehem Steel Co., Bethlehem, Pa.

Fig. 2. Case depth in relation to section size

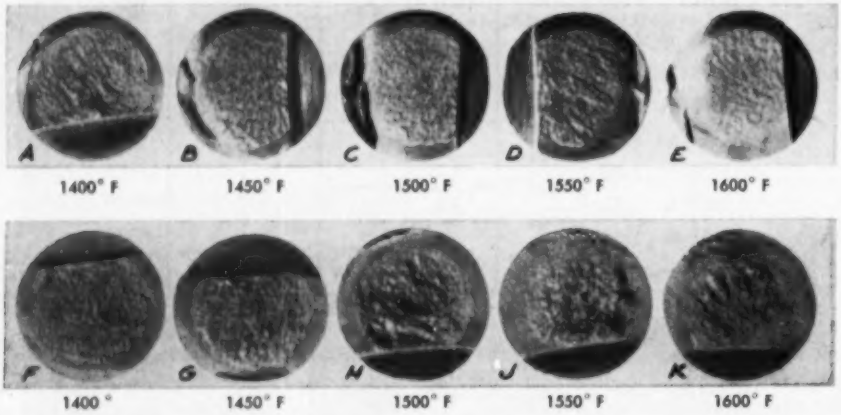
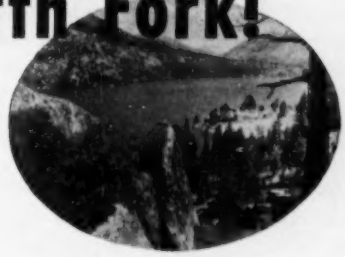


Fig. 1. Comparison of fine and coarse grained 1.0% carbon tool steel water quenched from indicated temperatures. Top row — fine grained steel — all specimens from same heat of steel. Bottom row — coarse grained steel — all specimens from same heat of steel. Specimen size: 1 in. round by 3 in. long — Courtesy of Vanadium Alloy Steel Co., Pittsburgh, Pa.

They can't afford projector trouble at North Fork!

Mr. J. A. Thomason (L) and Mr. Norman Gould with the Kodascope Pageant Sound Projector used in North Fork (Calif.) Union Elementary School.

Over 250 students attend this school and one third of the group is comprised of Mono Indians. Many students have been trained as projectionists.



Because of its remote location, the school district at North Fork, California, can't risk a sound projector breakdown. The district covers a half million acres in the Sierra Nevada Mountains and, although Fresno is only 45 miles away, many of these miles are vertical.

To the people of North Fork, sound movies mean a lot more than an Audio-Visual teaching aid. They are a source of community education and entertainment. They are used by the Boy Scouts, Brownies, 4H Club, and other community groups.

Mr. J. A. Thomason, the District Superintendent and Principal, and his Audio-Visual Director, Mr. Norman Gould, chose a KODASCOPE PAGEANT SOUND PROJECTOR for these reasons:

1. The Pageant is portable, easily taken from place to place.
2. The Pageant is sturdy, withstands heavy use.
3. The Pageant is easy to operate *and requires no lubrication.*
4. The optical system always projects a sharp, clear picture—corner to corner.
5. The sound system provides faithful reproduction from all types of sound film.
6. The Pageant is priced to fit the most modest school budget.

And how did North Fork's Pageant measure up? *After more than 18 months of almost constant use, its PAGEANT SOUND PROJECTOR has never lost an hour from mechanical, electronic, or optical breakdown!* In your school, as at North Fork, the Pageant will prove a useful and dependable teaching aid.

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CARBON TOOL STEELS

(Continued from page 30)

then series 1, 0, 00, 000, and 0000 paper can be employed. On polishing, the direction of motion is at right angles to the previous scratches until they disappear. The next grade is taken and polishing continued until the scratches from the previous emery paper are obliterated. This can be done until the last emery paper is used. Always remember that whenever a change in paper grade is made, the direction of motion of the specimen is at right angles to the previous scratches.

3. After the final emery paper which would be grade 0000, the cross section will be of sufficient smoothness for etching. Etching is done by immersing the polished section in a solution of nital until it has etched properly. The case will be dark whereas, the core will be lighter. This same procedure can be utilized on steel sections of various diameters and the case depth measured.

4. The nital etchant is composed of 2 parts of concentrated nitric acid and 90 parts of ethyl alcohol. In the metric system, one would have 2 cc. of nitric acid to 98 cc. of alcohol.

5. After etching is completed, the section is washed and dried by means of an air blast.

Both grain growth and depth hardness are influenced by external and internal or inherent conditions of the steel. External conditions may be listed as the condition of the steel prior to hardening, that is, whether it is in the annealed condition, hardened condition, and the like; the temperature from which the steel will be quenched; the quenching medium, and the like. Internal conditions or inherent conditions would depend on the chemical analysis, the initial grain size, the methods used in manufacturing or "mill practice," and the like.

The quenching temperature plays an important part in these two factors, especially, when an inherently coarse grain steel is hardened. As the temperature rises, not only will the grain size increase but also the depth hardening. A coarse grain steel reaction to increase temperatures is illustrated in Figure 1.

These physical characteristics that are exhibited by steels are known in industry under various terms, such as *body, timbre, inherent characteristics.* It should be remembered that in controlling timbre, body, or whatever other term one may use, the external factors can be governed by the user of the tool steel and by varying these conditions, he can obtain any desired hardening characteristics. Internal characteristics are to some extent under the control of the melter, thus, chemical analysis, melting practice, deoxidation, mill procedure — all can be controlled.

Quenching of the Carbon Tool Steels

The type of quenching media that can be employed is entirely dependent upon both the carbon-manganese content and the use of the tool steel. Water quenching or even brine quenching can be practiced where maximum hardness is required and the design of the tool is simple and no danger of cracking exists. When water quenching, the manganese content of the steel should be below 0.80 per cent with a carbon below 0.90 per cent. In cases where there is doubt as to either analysis or possibly cracking of the tool, an oil quench should be employed. In regard to water quenching, the temperature of the water should be at room temperature and the section violently agitated so that no soft spots occur. This is one disadvantage with water as a quenching media since the heat of the section as it enters the water creates steam directly at the surface and, if no agitation is employed during quenching, this steam will blanket the work and act as an insulator thus creating soft spots and a very unsatisfactory hardening job.

TABLE 2. Uses of Carbon Steel Tools
(Temper designations — factor is .10)

Temper	*Tool or Service*
7½	Battering tools, chipping chisels, cold chisels, concrete breakers, cold working cutters.
8	Anvil facing, beading tools, blacksmith tools, calking tools, channeling tools, hand chisels, chuck jaws, cold sets, dollies, flatters, solid and hollow rock drills, backing out tools, chipping chisels, concrete busters, rivet busters, scarifying tools, screw driver blades.
8½	Auger drills, engraver chisels, track chisels, asphalt cutters, flue hole cutters, flue rollers, four points, nail sets, cold punches, scrapers, vise jaws.
9	Cold swaging dies, forming rolls, knives, drawing punches, reamers, sheet forming tools, swages, tongs.
9½	Bushings, pneumatic stone chisels, cold working crowners, nut and bolt heading dies, cold heading dies, deep drawing dies, rivet dies, tack dies, drill bushings, inserts (punch and die), lathe centers, plug drills, center punches, punches, trimming punches, wood augers.
10	Cold blanking work, collets, finishing cutters, pipe cutters, cold cutting dies, cold forming dies, cold nut dies, cold trimming dies, crimping dies, cup forming dies, embossing dies, engraver dies, jeweler dies, stamping dies, forming tools, cold shear knives, cold mandrels, ring gauges.
10½	Lamination dies, roll threading dies, gauges, pilot pins, pistons, thread rollers, cold working trimmers, trimmer fingers, rock cutters.
11	Boring tools, cold chasers, woodworking chisels, counter boring tools, nail cutters, slotting cutters, thread cutters, adjustable threading dies, bolt threading dies, cartridge shell dies, coining dies, cold bending dies, cold blanking dies, machine threading dies, nail dies, pipe threading dies, center drills, flat drills, twist drills, hobs, draw knives, paper knives, wood knives, knurling tools, milling cutters, planer tools, plug gauges, expansion reamers, hand reamers, rifling tools, burnishing rolls, finish roll turning tools, cold stamps, staybolt taps, stone planer tools, taps, thread chasers, thread taps, turning tools, wood cutting tools.
11½	Hand stone chisels, hand points.
12	Automatic machine tools for nonferrous metals, brass cutting tools, nonferrous forming tools, burnishing dies, drawing dies, finishing reamers.
12½	Finishing cutters, rotary slitters, leather cutters.
13	Tools for cutting chilled cast iron, scale pivots, roll turning tools.

Americans move a million miles over the highways every minute of the day. Virtually all of this movement is by oil-powered vehicles. — *Petroleum Newsnotes*

Seventy per cent of all veterans on Veterans Administration disability compensation and pension rolls on April 1 served during World War II. The World War II veterans numbered 1,670,815; the total of all wars and the peacetime establishment was 2,368,225.

TEACHERS!

Your students' projects can bring you nationwide recognition in '53!

Enter your students' projects in Ford Motor Company's Industrial Arts Awards program!

The school projects shown at the right won acclaim from coast to coast for teachers and students who collaborated on these 1952 I.A.A. entries! More than 1,400 students and teachers won recognition across the country!

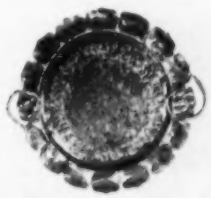
Again in 1953, teachers whose students win Outstanding Achievement Awards will be invited to dynamic Detroit, expense-free, as 3-day guests of Ford Motor Company. There they will attend the Annual Awards Dinner celebrating this leading national competition for teachers and students.

Boys and girls in grades 7 through 12, who are enrolled in industrial arts, or trade and industrial education courses, are eligible to enter. There are *thirteen divisions* with a place for *any* kind of project. Plan to enter your students' work in the 1953 I.A.A. program now.

You may have a winning project in your classes NOW!

Instructor A. B. Hardee and student Robert Timberlake, 15, of Lexington High School, Lexington, N. C., won top honors with this cedar chest.

Mr. Charles Furnari and 17-year-old James Bowles, of Wappingers Central School, Wappingers Falls, N. Y., were recognized for this leather gun belt.



This 24-inch aluminum tray won acclaim for maker Robert Arter, 16, and his teacher, Mr. J. F. Nihart, of Verdugo Hills High School, Sunland, California.

Mr. Clarence Cullimore supervised student Roger Phillips' winning architectural entry. They represent Bakersfield High School, Bakersfield, California.

FREE TRIPS TO DYNAMIC DETROIT

for teachers whose students win Outstanding Achievement Awards!

FILL OUT AND MAIL TODAY!

INDUSTRIAL ARTS AWARDS
Ford Motor Company, 2935 Schaefer Road
Dearborn, Michigan

Please send me FREE Information Booklet and entry blanks for the 1953 I.A.A. competition!

Name_____

School_____

Street_____

City_____ Zone____ State_____

ASSOCIATION NEWS

(Continued from page 10A)

ANNUAL DIRECTORS CONFERENCE

The 37th annual conference for directors of vocational and practical arts, guidance, private trade and commercial schools was held at Lake Placid Club October 12 to 15, 1952.

Dr. H. A. Overstreet, the guest speaker, spoke on "Relating Ourselves to Others in a Time of Tension."

President Max Komow of New York State Vocational and Practical Arts Association held a general session and announced convention dates as April 23 to 25, 1953, and New York City as the meeting place. The program will be announced later. — *A. W. Meyn.*

♦ The October meeting of the Allegheny County, Pennsylvania Industrial Arts Association was held in conjunction with the Western Pennsylvania Education Conference on October 10, 1952.

The combined luncheon of the Pennsylvania Industrial Arts Association; Trade and Industrial Education Association; and Iota Lambda Sigma, was held at 12:00 noon.

At 1:30 p.m., Dewey Barich, manager, Industrial Arts Awards, Ford Motor Company, Dearborn, Mich., gave an address titled "Behind the Scenes of the Industrial Arts Awards Program."

There also was a display of unusual projects, and *take home ideas.*

The officers for 1952–53 are: president, Donald Moon, Library, Pa.; vice-president, Earl Kuhn, Pittsburgh, Pa.; secretary, Joseph Kennedy, Tarentum, Pa.; treasurer, Charles Williams, Springdale, Pa.; and corresponding secretary, Ralph Steeb, Homestead Park, Md.

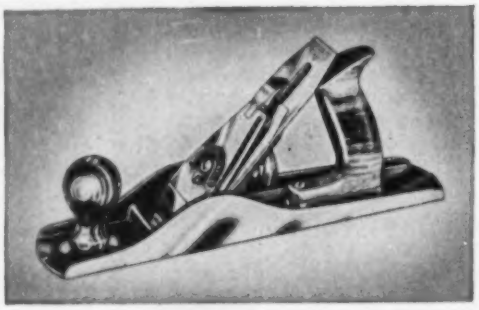
No. 75 BLOCK PLANE
For working end-grain surfaces. Invaluable, too, for many light jobs cutting with the grain. Short, light, easily controlled.

All Favorites

WHEN THEY'RE ALL MILLERS FALLS

No. 9 SMOOTH PLANE
For finishing large surfaces. Improved grip gives more hand room — better balance, control, comfort.

No. 14 JACK PLANE
For edging and all-around use. Quick, easy depth and side adjustments of irons.



Favorites for years with expert craftsmen — Millers Falls Planes are today better than ever in two important ways.

FIRST: All bench models are now equipped with new, scientifically re-shaped handles. The grip is roomier, more comfortable. That means easier handling, better control, less fatigue.

SECOND: All wood parts are now made of colorful Goncalo hardwood — brilliantly grained for new beauty — incredibly durable to withstand a lifetime of rugged use.

In addition, you still get all the time-tested features that have made Millers Falls Planes world famous for accuracy and performance. Write for full details on Millers Falls better-than-ever line of planes for every purpose.

MILLERS FALLS COMPANY
Greenfield, Mass.

MILLERS FALLS TOOLS
SINCE 1868

The Mark of Superiority

Personal News

DR. PROSSER PASSES ON

Dr. Charles A. Prosser, lifelong leader in vocational education in the United States, died in Minneapolis on November 26 at the age of 81.

Dr. Prosser first came into national prominence as an advocate of vocational education during the second decade of the century when he was active as executive secretary of the National Society for the Promotion of Industrial Education (1912–1915) and as the first director of the Federal Board for Vocational Education (1917–1919).

Charles A. Prosser
(from a photograph taken about 1915)

A native of New Albany, Ind., Dr. Prosser attended DePauw University at Greencastle, Ind., where he successively earned his bachelor's and master's degrees. From 1900 to 1908 he was superintendent in his native town and from 1908 to 1910 he studied in the graduate department of Teachers' College, Columbia University. This work was interrupted to accept the position of assistant commissioner of education for vocational education in Massachusetts. In 1915 he completed his thesis and received his doctor's degree from Teachers' College.

In 1915 he was appointed director of Dunwoody Institute, then in process of organization at Minneapolis, Minn., and this important post he held, with the exception of the two years from 1917 to 1919, until his retirement in 1945. He was the recipient of a number of honorary degrees from universities engaged in the preparation of vocational teachers.

The greatest service of Dr. Prosser's busy life was his leadership in securing the passage of the Smith-Hughes Law for the federal support of education and in inducing the states to accept the federal aid by establishing state systems of industrial, agricultural, and home-economics education. Always ready to make addresses or to act as consultant, his services were widely used for the establishment of vocational courses and schools and the improvement of federal and state laws. In recent years he did much for the improvement of secondary education for the 60

(Continued on page 23A)

DELTA
MILWAUKEE

DELTA QUALITY
MAKES THE
DIFFERENCE

No Added Safety Devices Needed

TO TEACH BLIND STUDENTS ON DELTA TOOLS

—says Frederick Hoyer, Wisconsin School for Visually Handicapped, Janesville, Wisconsin

"Our school was the first of its type, we believe, to introduce woodworking tools in connection with instruction of blind youth.

"At the beginning, the Bureau for Handicapped Children which supervises this school was not sure that blind pupils could be safeguarded from possible accidents in the use of power tools.

"I had been teaching here for over 5 years and was convinced, from my own training at the Minnesota School for the Blind, that well-built power woodworking units, incorporating the best safety features, could be used.

"To convince the others, I installed a Delta circular saw in my garage workshop. Demonstrations of my own operation of this tool convinced my associates that pupils could be taught to use Delta Power Tools with safety.

"So, in 1928, the school bought its own Delta tools: a circular saw, drill press, belt sander, jointer and lathe. "*We have never added an extra safety device to any of our Delta tools.* And, in all the years in which these machines have been used, no pupil has suffered an injury that required medical attention."

So it goes with Mr. Frederick Hoyer, another satisfied school instructor—an instructor that finds Delta tools safe, even though he is blind. What better proof that Delta tools are your best buy! Stop in at your Delta dealer—he'll be glad to show you the complete line.

DELTA QUALITY POWER TOOLS
Another Product by **Rockwell**

FREE–
THIS VALUABLE MAGAZINE FOR SHOP TEACHERS
POWER TOOL INSTRUCTOR
Four times a year . . . use the coupon

DELTA POWER TOOL DIVISION
ROCKWELL MANUFACTURING COMPANY
402A N. LEXINGTON AVENUE • PITTSBURGH 8, PENNSYLVANIA

☐ Send me the latest Delta Catalog.
☐ Put me on the "Power Tool Instructor" free subscription list.

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Position_____
School_____
Address_____
City_____ Zone____ State____

EDUCATIONAL
LAMP PROJECTS

Of particular interest to instructors — in woodworking, general shop, plastics, crafts, electricity, and many other shop courses. Students can design and make the body of the lamp. We supply all other parts necessary — sockets, cords, plugs, shades, harps, switches, etc. Over 700 different parts shown in wholesale catalog. A MUST for all instructors interested in keeping students occupied with highly educational and useful projects. Send 25¢ today for wholesale price list and parts catalog — refundable on first order.

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Dept. 100-K1 • 27 S. Desplaines St. • Chicago 6, Ill.

1. GENERAL MECHANICAL DRAWING
Offers a new psychological approach to the high school level with 135 projects selected for an exploratory course for students specializing in technical subjects.
JERVIS 316 pages, 6" x 9", 369 illustrations $3.00

2. INDUSTRIAL ARTS IN GENERAL EDUCATION
Complete analyses of Industrial Arts objectives; information on "how to plan school shop" and approved teaching methods.
WILBER 362 pages, 5¼ x 8", illustrated $4.00

3. EXPLORING THE GRAPHIC ARTS
Provides comprehensive orientation in graphic arts history, processes, materials, industries and occupations.
288 pages, 6" x 9", illustrated
MARINACCIO and OSBURN $3.50

Please send me the examination copies of the helpful professional International texts I've circled.

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I have printed my name on margin.

International
TEXTBOOK COMPANY
SCRANTON, DEPT. 660, PENNSYLVANIA

Everything in Electronics
FOR THE SCHOOL!
FREE! 236-PAGE 1953
ALLIED
RADIO-TV CATALOG

FAMOUS RADIO LAB KIT • 10 KITS IN ONE!
Amazingly instructive: builds receiver, amplifier, oscillator, signal tracer, timer, photo cell relay, etc. With all parts, tubes, mike, instructions. 83-265. Only.....$14.25
"Ranger" AC-DC Radio Kit. A popular school project kit. Complete with cabinet. 83-275. Only $17.85
Dozens of other kits available.

Automatic Control TAPE RECORDER
Most exceptional recorder value on the market. Fully described in ALLIED's Catalog. 96-485. Only.....$99.50

SEND FOR IT!
ALLIED is the one *complete, dependable* school supply source for *all* radio and electronic needs. Our 236-page 1953 Buying Guide features the world's largest selections of:
- Radio Training Kits
- Laboratory Instruments
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- FM, AM Tuners & Radios
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- Recorders & Accessories
- Sound Equipment
- Tools and Books

Depend on ALLIED for time-saving, money-saving, expert electronic supply service. Write today for our FREE 1953 Catalog — your guide to *everything* in Electronic equipment.

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833 W. Jackson Blvd., Dept. 51-A-3
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Specialists in Electronic Supply for Schools

SAVE *on Plastics*
FOR SCHOOL SHOP PROJECTS!

Colored Plexiglas Assortments
in translucent, opaque and transparent reds, blues, greens, greys, whites and others.
NEW LOW PRICES
10 LBS. $9.50
20 Lbs.....$17.00
40 Lbs.....30.00
100 Lbs.....70.00

Finest quality and the best colors in all new, flat, paper-masked Plexiglas and Lucite. Sizes 6" x 12" and larger in the assortment.

Immediate Delivery

Cadillac Plastic Co.
15113 SECOND BLVD.,
DETROIT 3, MICHIGAN

PERSONAL NEWS

(Continued from page 20A)

per cent of young people whose interests and abilities do not permit them to see any benefits in academic education leading to college or a highly skilled occupation.

Surviving are his widow and a son, William Lloyd Prosser, dean of the University of California Law School.

♦ JOSEPH H. STEPHENSON, vice-principal of the San Diego Vocational School, and also supervisor of trade and technical education, San Diego, Calif., has been granted a leave of absence to accept a position with the United States government as Vocational Training Consultant to the Indonesian government. The leave is effective from October 1, 1952 to June 30, 1953.

♦ HERBERT S. WOOD, former principal of John C. Fremont High School, has been appointed director of the Trade-Technical Junior College, Los Angeles, Calif.

♦ PROFESSOR DENNIS H. PRICE, formerly of Indiana State Teachers College, has been appointed Associate Professor of Industrial Education at the University of Cincinnati. He began his new duties on September 15, 1952.

♦ R. L. WELCH, former chief of T. and I. Education, Board of Vocational Education, Madison, Wis., has been appointed associate professor of industrial education at Florida State University, Gainesville, Fla.

♦ RALPH E. BETTERLEY, for the past six years an assistant professor of industrial education at The Stout Institute, Menomonie, Wis., has accepted an assistant professorship of industrial engineering at The Technological Institute, Northwestern University, Evanston, Ill.

Mr. Betterley taught general metal and welding at Stout. He will teach courses in metal processing at Northwestern.

♦ TOM DEAN, formerly of the industrial-arts staff at Iowa State College, has accepted an appointment at the Long Beach State College, California.

News Notes

♦ Bradley University's 1952 Summer Session enrollment of graduate students in industrial education numbered one hundred and thirty with the completion of registration for the second session on July 17. These graduate students were primarily teachers of industrial arts and vocational education, and they represented 28 states, Canada, Hawaii, and the Canal Zone. More than fifty of these students are working toward the doctor of education degree. Visiting instructors for this course were: Dr. L. Thomas Hopkins, professor of education at Teachers College, Columbia University; Dr. Anatol Rapoport, assistant professor of mathematical biology, University of Chicago; Dr. Lindley H. Dennis, former executive secretary of the American Vocational Association, and now educational consultant in the field of vocational education; and Dr. George E. Kohrman, head of the Division of Vocational Education at Western Michigan College of Education, at Kalamazoo.

♦ The Industrial Arts Club of Ball State Teachers College, Muncie, Ind., have elected the following officers for 1952–53: president, Wally Sacks; vice-president, Milton Ross; secretary-treasurer, Don Portolese; and sponsors, Bernard Josif and Willard Allen. — *Don Portolese.*

♦ The Senior High School, Marshalltown, Iowa, has turned their machine shop into a general shop. They will now have work areas in machine turning and shaping, sheet metal, spinning, welding, and bench metal. John Barrigar and W. A. Dickinson are the instructors.

♦ Plans for the distribution of Life filmstrips through the Society for Visual Education, Inc., Chicago, and their dealers, have just been completed with the editors of Life magazine, according to an announcement by W. H. Garvey, Jr., president of S.V.E.

The completion of this new distribution arrangement furthers the original plan and aim of the Life magazine editors to make their pictorial resources available to the largest possible group of educators and students.

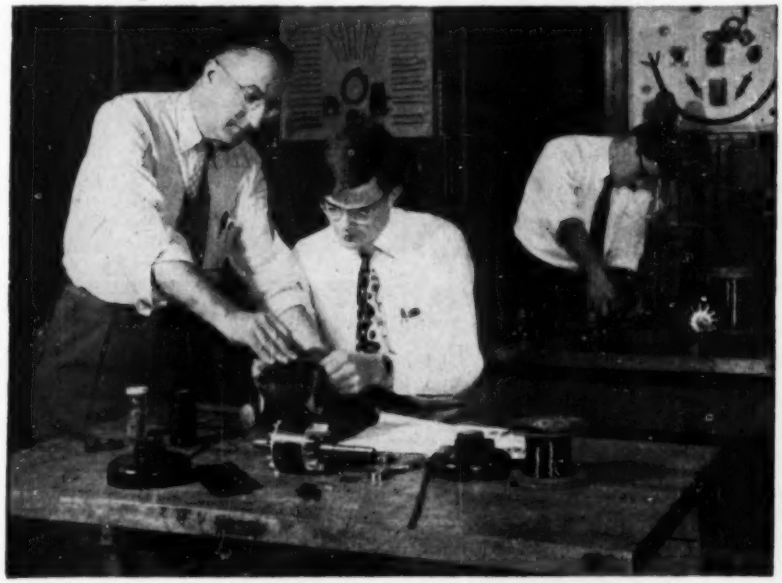
♦ Coronet Films, 65 E. South Water St., Chicago 1, Ill., announces the following new films:

"Safety in Winter" — 1 reel, sound, color ($100) or B & W ($50); Educational Collaborator: Vivian Weedon, Ph.D., Curriculum Consultant, School and College Division, National Safety Council.

"Safety with Everyday Tools" — 1 reel, sound, color ($100) or B & W ($50); Educational Collaborator: Vivian Weedon, Ph.D., Curriculum Consultant, School and College Division, National Safety Council.

"How to Investigate Vocations" — 1 reel, sound, color ($100) or B & W ($50); Educational

(Continued on next page)



Building standard commercial motors gives students actual experience with motor design.

Motor design easily understood

Students "learn by doing" with versatile G-E motor construction kits

Having the student build his own motor is the easiest and most practical way to teach motor design and construction. At the same time, G-E motor construction kits give your students valuable experience in working with production line parts to build a complete motor for use on home and school machines.

The student winds the coils, tests the windings, and assembles all mechanical parts. Machine-tooled parts reduce working time and permit the student to concentrate on electrical work and principles.

For more information about G-E motor and generator construction kits contact your nearest G-E Apparatus Sales Office, or write for Bulletin GEC-675 to General Electric, Sect. 687-109, Schenectady, N.Y.

Construction kits are availble for motors with the following ratings:

¼ hp 115 volts single-phase capacitor-type
½ hp 115/230 volts single-phase capacitor-type
½ hp 220 volts three-phase squirrel-cage
300 w 125 volts d-c generator or motor

YOUR COPY of this 16-page bulletin, GEA-5526, containing information on the specially designed G-E Educational Equipment for electrical laboratories is available on request.

GENERAL ELECTRIC

NEWS NOTES

(Continued from previous page)

Collaborator: Frank S. Endicott, Ph.D., Associate Professor of Education, Director of Placement, Northwestern University.

"Personal Qualities for Job Success" — 1 reel, sound, color ($100) or B & W ($50); Educational Collaborator: Raymond C. Goodfellow, Director of Business Education, Newark Public Schools, Newark, N. J.

"Respect for Property" — 1 reel, sound, color ($100) or B & W ($50); Educational Collaborator: George B. Smith, Ph.D., Dean, School of Education, University of Kansas.

♦ Reynolds Metals Company, 2500 South Third St., Louisville 1, Ky., announces that its new "1953 Reynolds Aluminum . . . Mill Products" brochure is now ready for distribution. It outlines the increasing advantages of wrought aluminum alloys, lists aluminum mill products, and details the various product forms, finishes, alloys, tempers, and sizes that are available. Casting alloys are also included.

The new brochure will be mailed without charge, upon request to the Advertising Department of the afore-mentioned firm.

♦ On Monday, April 28, 1952, the city of Niagara Falls opened what is probably the first public school building devoted entirely to adult education.

SHELDON
CHICAGO U. S. A.

These 3 quality machine tools are especially adapted to school use because of their:

AMPLE SIZE — permits wide range of practical projects.

STANDARD DESIGN — true industrial tools with standard controls.

PERMANENT ACCURACY — these tools hold their accuracy under student abuse, do not require constant rebuilding and servicing.

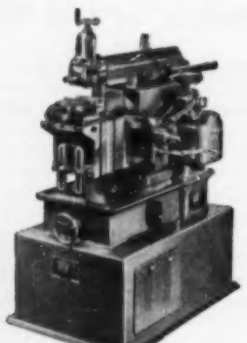
SAFETY — all drives completely enclosed; all speed changes made by external levers.

PRICE — these are moderate priced tools that school shops can afford.

Write for the SHELDON Catalog showing and describing (with complete specifications) the line of: SHELDON Precision Lathes (9", 10", 11", and 13" Swing), Sheldon Milling Machines, Sheldon Shapers and Sheldon Machine Tool accessories and attachments.

Horizontal Milling Machine

No. T5568 11¼" Swing Lathe


12" Back Geared Shaper

SHELDON MACHINE CO. Inc.
Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
4244 N. KNOX AVENUE • CHICAGO 41, ILLINOIS, U. S. A.

New Publications

Mitography

By Albert Kosloff. Cloth, 134 pp., 6¼ by 9½ in., illus., $3.25. The Bruce Publishing Co., 400 North Broadway, Milwaukee 1, Wis.

A concise but comprehensive and practical treatise on Mitography (screen process printing). The book is interestingly written and presents the student reader with a history and principle of Mitography, materials and equipment, screen fabrics and screen process plates, knife-cut-film printing plates, photomitographic-film printing plates, photomitographic direct plates, washout printing plates, block-out and other Mitographic plates, and Mitographic printing on various surfaces and materials.

Gem Cutting

By J. Daniel Willems. Cloth, 224 pp., 6¼ by 9 in., illus., $4.50. Chas. A. Bennett Co., Inc., Peoria, Ill.

This is the second edition of this book on gem cutting which both amateur and professional gem cutters will find quite helpful.

The beginner will find the material on gem materials, how to saw, cut, grind, and polish the gems, interesting and enlightening.

Cutting and polishing facets also is explained.

A full description of how the beginner can equip his shop also is given.

Materials and Processes

By Max Kohn and Martin J. Starfield. Cloth, 483 pp., 5¾ by 8½ in., illus. The Macmillan Co., New York, N. Y.

An excellent book for the instructor who is seeking related subjects material for his classes in woodwork, ceramics, metals, or plastics.

The book also contains five chapters on fuels.

General Trade Mathematics

By Edwin P. Van Leuven. Cloth, 553 pp., 6¼ by 9¼ in., illus., $3.80. McGraw-Hill Book Co., Inc., New York, N. Y.

The second edition of a book designed especially for industrial and technical schools.

Approximately 150 practical topics are included, each explained by examples showing how to solve problems that arise under normal shop conditions.

The work is illustrated with 500 illustrations. Chapter 6 is devoted to vocational finance, and covers family budgeting, social security, unemployment benefits, workman's compensation and disability insurance, and income taxes.

House Construction Details

By Nelson L. Burbank. Cloth 384 pp., 5⅝ by 11¼ in., illus., $4.95. Simmons-Boardman Publishing Co., New York City.

This is the third edition of this useful vocational school text. The present revision contains 74 more pages and approximately 600 more illustrations.

The typical construction details — foundation forms, sills, girders, etc. — are placed at the beginning, while the later operations and details follow in natural order so that the user follows each development step by step until the house has been completed.

A complete reference index assists in locating individual details.

(Continued on page 26A)

ATF *Good School News*

GRAPHIC ARTS—THE EDUCATIONAL FIELD WITH A FUTURE

American Type Founders, Department of Education, 200 Elmora Avenue, Elizabeth, New Jersey

DETROIT INTERMEDIATE SCHOOLS HAVE BROAD GRAPHIC ARTS PROGRAM

Established as part of educational system for many years

Graphic arts education has been an accepted part of the industrial arts program in the Detroit public schools for more than thirty-five years.

Seventeen of the Detroit junior high schools give graphic arts instruction to their eighth and ninth grade pupils.

In Detroit, every graphic arts department is equipped with type cabinets, two power presses, and a great variety of smaller equipment, so that each pupil may have as complete training in printing as is possible within the time allocated to this program.

Typography and actual press work are emphasized, and other phases of graphic arts are included as part of the regular instructional program.

Students redistributing foundry type as a part of their training in graphic arts at the Durfee Intermediate School, one of seventeen Detroit intermediate schools with complete graphic arts departments.

ATF Information Aids Graphic Arts Industry

The Little Giant "Ten Strike" booklet is one of many publications ATF has prepared to aid the Graphic Arts Industry. With 16 photographs of Little Giant features, this booklet serves to thoroughly acquaint the reader with this particular press, and enables him to form a standard for comparing various presses of this size. ATF's Department of Education will be glad to furnish a copy of this booklet for use in your classes.

Consult ATF's Specialized Department of Education Engineering Service

ATF maintains specialized services for vocational and industrial schools.

We can assist you with your layout for a graphic arts department or shop, in outlining training courses, or finding competent instructors.

ATF also serves as a complete source of supply for equipment.

Call on us today. Write for your copy of ATF's booklet, "Career Opportunities in the Printing Industry."

NEW DE ROOS Type Face

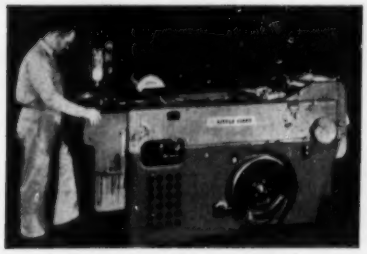
combines delicate beauty with all-around usefulness!

The new type face designed by the celebrated S. H. DeRoos is eminently graceful due to slender forms with full length ascenders and descenders. They are carefully balanced in color so that they print well on both rough and coated papers. If you desire a more complete showing, write for specimen folder.

Popularity of ATF Little Giant Presses for Graphic Arts Instruction Increases Rapidly

The recent installation of an ATF Little Giant press at the Essex County Vocational School, Newark, New Jersey, brought the total number of these 12x18 automatic cylinder presses now in use in the school field to 118.

They are now being used in the graphic arts departments of schools in thirty-four states.



The ATF Little Giant is an ideal press for student instruction because of its ease of operation, and the wide variety of work it can print. It introduces the student to the whole field of letterpress printing because it operates on the same principle as the Kelly and other larger presses.

Completely guarded, with no exposed reciprocating arms or levers, and having a large, easily accessible brake for immediate stops, the Little Giant is the safest press on the market today.

For students planning a future in the graphic arts, experience on the Little Giant 6 provides particularly valuable experience, since it is a press that is finding ever-increasing use in the industry.

NEW PUBLICATIONS

(Continued from page 24A)

An Introduction to Decorative Woodwork

By Herbert H. Grimwood and Frederick Goodyear. Cloth, 239 pp., 7½ by 10 in., illus., $8.50. Chas. A. Bennett Co., Inc., Peoria, Ill.

This is the third and enlarged edition of a book which presents numerous examples of beautiful pieces of woodwork and furniture without offering a series of projects for mere duplication.

The examples shown picture many beautiful methods of decoration and the entire book offers much provocative material that will tempt any real craftsman.

Inventory-Analysis of Industrial Arts Teacher Education Facilities, Personnel, and Programs

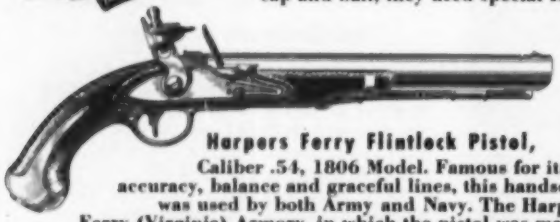
Edited by Walter R. Williams, Jr., and Harvey K. Meyer. Cloth, 177 pp., 6¼ by 9¼ in., $2. McKnight and McKnight Publishing Co., Bloomington, Ill.

A compilation of data on the date of establishing the industrial-arts department, degrees granted, staff, undergraduate and graduate offerings, in the various teacher education institutions of the United States.

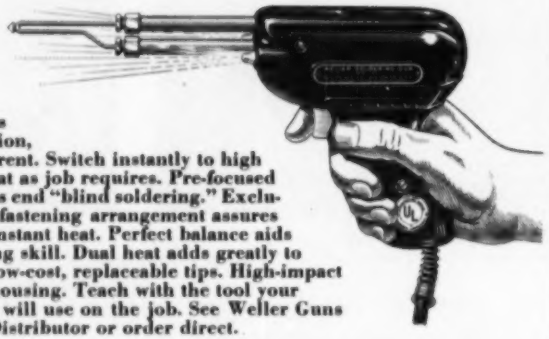
The material presented in this book was gathered and compiled under the auspices of the American Council on Industrial Arts Teacher Education, Miami University, Oxford, Ohio.

Famous Guns

Volcanic Repeating Pistol
(Smith & Wesson) Caliber .36, 1854 Patent. Forerunners of the famous Smith & Wesson line of hand-guns, the Volcanic pistols marked the beginning of the end for percussion firearms. Their design was revolutionary; instead of the old-time cap and ball, they used special *self-contained* cartridges.



Harpers Ferry Flintlock Pistol,
Caliber .54, 1806 Model. Famous for its accuracy, balance and graceful lines, this handsome pistol was used by both Army and Navy. The Harpers Ferry (Virginia) Armory, in which the pistol was made, was raided by abolitionist John Brown in 1859, and was burned during the Civil War.



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The Craft of the Metalworker

By R. S. Duddle. Cloth, 160 pp., 5⅝ by 8¼ in., illus., $4. Anglobooks, 475 Fifth Ave., New York 17, N. Y.

A book in which the various metals commonly used in industry and art metalwork are described. The processes used in cutting, forming, and joining metals also are clearly presented. The tools, machines, and methods of holding are all illustrated by means of good line drawings.

The six chapters into which the book is divided describe how to arrange the workshop; lay out the metal; form it to shape; forge, emboss, or stamp it; join it; make castings; and harden and temper steel.

How Children Learn to Read

By Helen K. Mackintosh. Office of Education Bulletin 1952, No. 7. 16 pp., 15 cents. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

One of a series of bulletins on the place of subjects in the elementary school curriculum. The over-all publication, *The Place of Subjects in the Curriculum*, Bulletin 1949, No. 12 (15 cents), showed how subject matter is introduced into the program in a modern school.

Other bulletins now available are:

Children Learn to Think, Bulletin 1951, No. 10 (15 cents)

How Children Use Arithmetic, Bulletin 1951, No. 7 (15 cents)

How Children Learn About Human Rights, Bulletin 1951, No. 9 (15 cents).

Education for All American Youth: A Further Look

By the Educational Policies Commission of the National Education Association of the United States and the American Association of School Administrators, 1201 Sixteenth St., N.W., Washington 6, D. C. Paper cover, 402 pp., 6 by 9 in., $2.

The commission presents in this revision of their earlier book, an intensive study of the educational needs of youth both during emergency periods and the era of peace which is hoped will follow when the present world unrest has finally subsided.

The need of youth under the compulsory school attendance until the eighteenth birthday, the implications of general and vocational education for these young people, and the growth and value of junior college courses for students in rural and urban America are thoughtfully discussed and many suggestions for our present educational systems are set down for the careful study of educators everywhere.

Art for Young America

By Florence W. Nicholas, Mabel B. Trilling, and Margaret Lee, in collaboration with the late Elmer A. Stephan. Cloth, 292 pp., 6¼ by 8⅞ in., illus., $3.20. Chas. A. Bennett Co., Inc., Peoria, Ill.

This is a textbook for beginners in art classes. The authors have aimed at providing in it creative activity, appreciation, and a knowledge of art which the student can apply in his daily life.

The subject is interestingly presented and the illustrations are carefully selected.

Dictionary of Games

By J. B. Pick. Cloth, 318 pp., 5⅛ by 8¼ in., $4.75. The Philosophical Library, New York City.

This is an interesting book which describes how to play 458 indoor and outdoor games.

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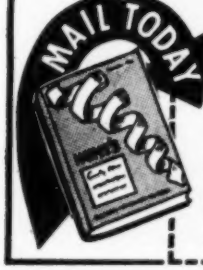

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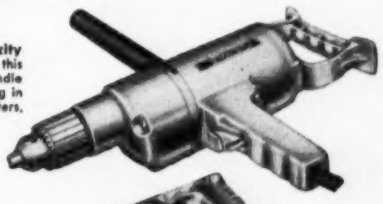

No. 112, ½" capacity Among other features this drill has the spindle offset to permit drilling in close quarters.

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SHOP EQUIPMENT NEWS

TWO-SPEED SOLDERING IRON

Snap-on Tools Corporation, announces the R-115A, a lightweight, two-speed soldering iron that goes to work *fast*. It weighs only 9 ounces, and it heats to soldering temperature in just 40 seconds.

This fast heating is accomplished by use of a two-speed circuit. Depressing the thumb button on the handle delivers 100 watts at the tip for fast heating or for extra heat for heavy soldering jobs. Once the iron is heated, it "idles" at 25 watts . . . all the power necessary to maintain normal tip temperature for continuous soldering operation. To aid in efficient heat transfer, the ceramic enclosed heating element goes almost to the end of the hollow soldering tip.

Snap-on Tool Two-Speed Soldering Iron

All tips are plated with "Vanderloy," a substance which protects the copper from deterioration. This plating takes tinning much more readily than copper and will give many hours of extra service even under continuous operating conditions. A standard tapered chisel edge tip is furnished with the R-115A; however, six additional styles and shapes are available, and all are easily and quickly interchanged.

The handle is molded of black Durez which is shockproof. The heavy rubber-covered cord is held in the handle by a strain reliever to eliminate any tension being applied to the switch connections. Two models are available, one for 115 volt a.c. and the other for 28 volt operation.

For further information, write to *Snap-on Tools Corp., Kenosha, Wis.*

For brief reference use IAVE — 0101.

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4 INCH SQUARE LEATHER-LIKE TUFTS

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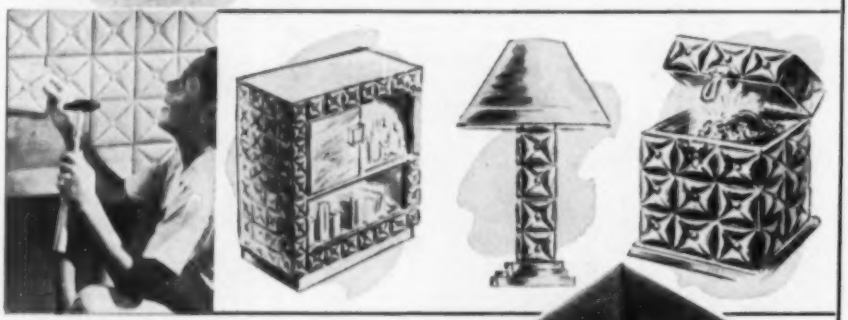
Economical We offer a special wholesale price of 6c per square to schools. Dek-tufts retail for 10c per square throughout the country. A box of 50 threaded matching nails costs only 25c. As economical as Dek-tufts are, they produce a finished product which any parent would be proud to display at home.



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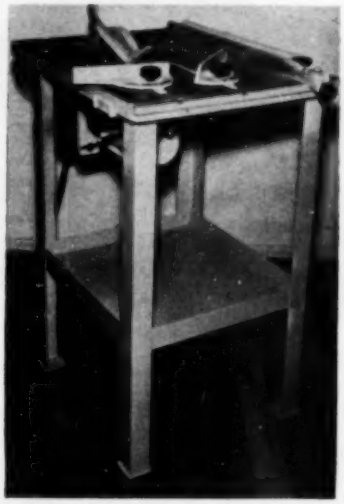
NEW HESTON AND ANDERSON 8-IN. TILTING ARBOR SAW

Heston and Anderson have announced the addition of a new 8-in. tilting arbor saw to the company's line of woodworking equipment. The new saw, known as Model 852, is of heavy gray iron construction and features a motor that tilts with the saw.

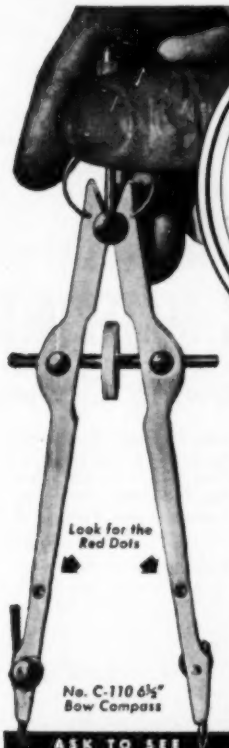


Heston and Anderson 8-in. Tilting Arbor Saw

It is designed so that the motor keeps the same tension on the belt and makes possible complete alignment of parts at all times.

Other features of this new saw are: life sealed ball bearings for protection against dirt and dust, miter gauge slots on both sides of the saw, a modern steel floor stand, easily accessible controls, sawdust chute, large 26 by 20-in. cast iron table top, extra long aluminum rip fence

(Continued on page 31A)



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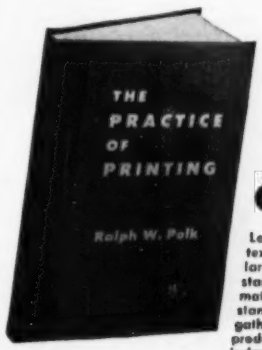
Gives thorough coverage for both theoretical and practical automotive experiences. Contains a complete set of teaching tools covering the 5 major areas of automotive training — driver education, consumer education, engines, electrics, chassis. Presents enough material for a 4-semester course. 320 pages . . . 383 illustrations. SEE FOR YOURSELF — SEND FOR 30-DAY EXAMINATION COPY. By HAROLD T. GLENN.....$3.96. Book No. 1 in coupon.



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SHOP EQUIPMENT NEWS

(Continued from page 28A)

with accurate gauge, and splitter with safety guard attached.

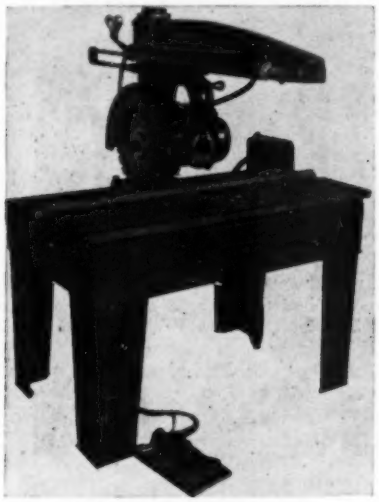
The distance from the saw to the front of the table is 12 in.

For further information, write to *Heston and Anderson, Fairfield, Iowa.*

For brief reference use IAVE – 0102.

DEWALT MODEL GE OFFERS FLEXIBLE POWER CROSS FEED

DeWalt, Inc., makers of radial arm cutting tools, offers a new Model GE machine with power cross feed. This new machine retains all the features of flexibility, while giving excellent performance on power cutoff operations. Besides the normal straight cutoff, the DeWalt machine also makes miter cuts, bevel cuts, and compound miter (bevel miter) cuts with the power cross feed. Materials up to 2 by 18 in., can be cut with the power cross feed without any adjustments in the air feed mechanism.



De Walt Model GE with Power Cross Feed

The air feed cylinder may be detached quickly by removing only one stud, for placing the machine in manual operation, thus reaping all the benefits of the flexibility of the radial arm multipurpose machine.

For complete information on the DeWalt GE with power cross feed, see the current issue of the DeWalt bulletin, "Saw Tips," or stop in to see your local DeWalt dealer, or write direct to *DeWalt, Inc., Lancaster, Pa.*

For brief reference use IAVE – 0103.

NEW SHOP ACCESSORIES ANNOUNCED BY MAGNA

Multishop uses feature each of three new Shopsmith accessories announced by Magna Engineering Corporation.

Rust Preventive Spray is useful for protecting all exposed iron or steel surfaces. It comes in a pressurized can that simplifies application. It is sprayed on hand saws, circular saw blades, drills, arbors, etc.

Liquid adhesive, designed by Armstrong Cork Co., is a sanding disk adhesive. It is pressure sensitive; useful, too, for numerous household uses where a strong commercial type adhesive is needed. Applied with a brush applicator which is attached to the cap.

New Magna Shop Accessories

Magna-Lube is a specially designed cup grease. It comes in a tube equipped with a nozzle tip which makes the grease clean to use and easy to apply. It is formulated for Magna by Standard Oil Company of California.

For further information see your leading hardware store, department stores, and Montgomery Ward Stores, or write to *Magna Engineering Corp., Menlo Park, Calif.*

For brief reference use IAVE – 0104.

UTICA OFFERS NEW TOOL CATALOG

Utica Drop Forge & Tool Corporation are now offering their new tool catalog No. 66-1952 which is replacing Utica catalog No. 63-D currently in use.

(Continued on next page)

TOLCO FOUR STUDENT WOODWORKING BENCH

Model TM-12 with 2¼" hard maple, edge grained, electronically glued top 54" x 64". Heavy metal base with 12 lockers.

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269 N. Freedom Avenue — ALLIANCE, OHIO
Established 1894 — Our 58th Year

SHOP EQUIPMENT NEWS

(Continued from previous page)

The 24-page catalog, well illustrated, contains a useful list of decimal equivalents and pertinent data on all Utica tools in many sizes.

Requests for the new Utica catalog No. 66-1952 should be directed to H. J. Zellweger, ad manager, *Utica Drop Forge & Tool Corporation, Utica 4, N. Y.*

For brief reference use IAVE — 0105.

TWO NEW KODASLIDE PROJECTORS

Two new Kodaslide Projectors — the Kodaslide Highlux II and the Kodaslide Highlux III — have been announced by the Eastman Kodak Company.

The new projectors are designed to give top-quality projection with maximum brilliance and maximum safety at a minimum price.

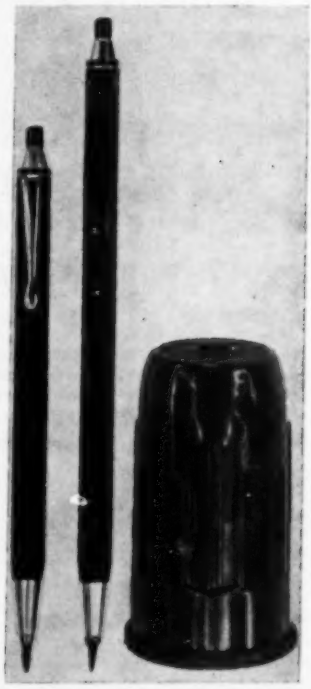
For further information write to *Eastman Kodak Co., Rochester 4, N. Y.*

For brief reference use IAVE — 0106.

LEAD HOLDER AND POINTER

A new mechanical lead holder and lead pointer has just been introduced by the Alvin Company of Windsor, Conn. This holder and pointer is an aid to engineers, draftsmen, bookkeepers, students, and others who use a pencil daily. It keeps a constantly pointed lead always within reach.

This sturdily constructed pointer is compact and foolproof. It is made of black plastic and is equipped with razor sharp blades that can be changed in seconds. The lead holder highlights coil spring ejection, perfectly balanced hard rubber barrel and will hold any standard size drawing lead. Holders are available with lead in degrees 7B to 9H, with Alvin Paramount Lead Refills also in 18 degrees of hardness.



Alvin Lead Holder and Pointer

Additional information may be obtained by writing the *Alvin Company, Department R, Windsor, Conn.*

For brief reference use IAVE — 0107.

NEW NIAGARA MACHINE AND TOOL WORKS BULLETIN

Niagara Machine and Tool Works has published a new No. 103 bulletin which is designed particularly for school use. In it there are plans for sheet-metal shops of various sizes together with lists of sheet-metal tools and machines suggested for these shops. Reference tables are printed on the back cover.

In the pocket on page 5 there is No. 200 booklet illustrating and describing most of the equipment recommended for school shops.

For a copy of the bulletin write to *Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo 11, N. Y.*

For brief reference use IAVE — 0108.

NEW DE VILBISS SPRAY GUN

A new spray gun with sensitive controls for fine spraying has been introduced by the DeVilbiss Company.

The new gun, designated as Type EGA, is designed for small refinishing jobs, stenciling, blending, high-lighting, and decorative work. Its spray pattern is medium sized and can be adjusted to practically pin-point size for touch-up work.

(Continued on next page)

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LINESHAFTING

Specifically designed to individually motorize machine tools originally driven by lineshaft, LIMA GEARSHIFT DRIVES were selected by Ohio State University to provide its students with the very best in modern machine shop equipment.

Ohio State is but one of many schools throughout the nation that have modernized their machine shops with LIMA DRIVES, providing the utmost in functional safety, adequate lighting, proper machine location and the complete elimination of hazardous lineshafting.

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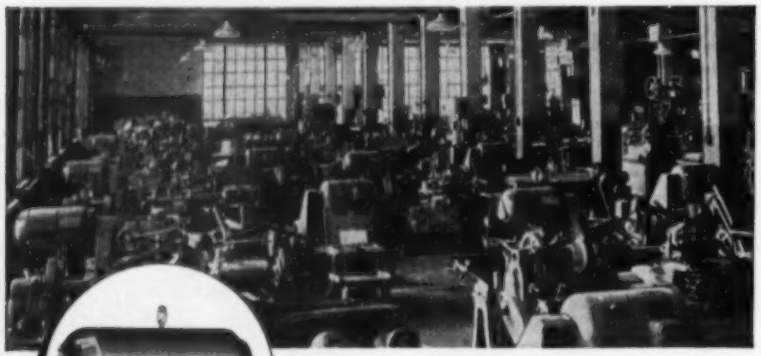

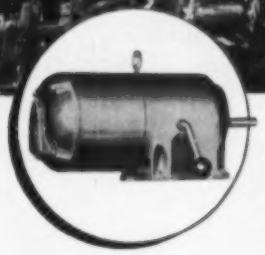

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No 450 Plurality Jr.

NOW AVAILABLE IN 3 SIZES
No. 425 Plurality Sub Jr.
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No. 475 Plurality

Grinding can be done on a cone, coarse or fine or emery leather stropping or emery wheels. Unit is compact, efficient, serviceable, easily accessible and has ball bearing direct motor drive. Especially guarded for school shop use. Details on request.

MUMMERT-DIXON CO.
HANOVER, PENNSYLVANIA
Originators and Pioneer Manufacturers of Oilstone Tool Grinders

(Continued from previous page)

The gun body of the EGA is an aluminum die casting, which permits the use of a wide range of materials including latex.

The new gun is lightweight and yet designed very ruggedly. It can be used with standard glass jar fluid containers of 2-, 4-, 6-, or 16-oz. capacity. The trigger which actuates both the

New DeVilbiss Spray Gun

air valve and fluid needle is designed for either left- or right-hand operators. Each gun is tested before shipment.

This firm also has published a booklet titled "Spray Painting Made Easy," which thoroughly explains spray painting procedures, job setups, and the like.

For further information, write to *DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.*

For brief reference use IAVE — 0109.

JUDGING DELTA SCHOOL SHOP LAYOUTS

Judging of the entries in the Delta school shop layout contest began in Chicago early in September. Under the title-theme "School Shops for Today and Tomorrow," Delta's contest began in November, 1951, and closed on July 31, 1952. Entries were received from South America, Europe, and many other points throughout the world.

Judges included Dr. C. C. Caveny, dean and chief executive officer, Chicago campus of the University of Illinois; Dr. C. H. Groneman, head, Industrial Education Department, Texas A. & M. College; Hans W. Schmidt, nationally known authority and consultant on school planning and building; Dr. William W. Theissen, asst. supt. of schools, Milwaukee Public Schools; and Gilbert G. Weaver, director of training of the Bureau of Vocational Curriculum, Development and Industrial Teacher Training of New York State Education Department.

STEEL ASSORTMENT KITS

The Solar Steel Corporation offers a steel assortment which should be of great interest to homecrafters and shop teachers.

(Continued on next page)

YOU are invited to examine these NEW and RECENT CARPENTRY and BUILDING TEXTBOOKS

SIMPLIFIED CARPENTRY ESTIMATING by J. D. Wilson and C. M. Rogers. This book is to help you teach your students the rules and methods of estimating so they can make accurate building material lists. The constructional order of quantity survey is used — foundation materials, framing lumber, exterior finish, interior finish, and hardware. Special chapters include: Stair Estimating, Carpentry Mensuration, Estimating Short Cuts, Building Information and Tables, Labor Hours per Unit of Work, and others. 1950. 5th ed., 2nd prtg., 304 p., 123 illus., 60 tables, 5 x 7¾, cloth, $3.75.

HOUSE CONSTRUCTION DETAILS by N. L. Burbank. The various sections are presented in natural construction sequence. Typical details of foundation forms, sills, girders, etc., appear at the beginning, while the more complex follow in regular order. Thus, the student follows topic by topic until the house is built. New features include: a chapter of Better Detail Plates; details of modern farm buildings; descriptions of new building materials; manufacture and erection of pre-fabs; data on painting, heating, insulation, etc. 1952. 3rd ed., 388 p., 2,100 illus., 8½ x 11½, cloth, $4.95.

HOUSE CARPENTRY AND JOINERY by N. L. Burbank. Describes every essential operation performed by the carpenter in the construction of a dwelling. The new 5th edition explains current construction methods including the building of basementless houses, prefabricated dwellings, and multi-family structures, and an outstanding chapter on the important types of roof framing. Every step is explained in easy-to-understand language; clear illustrations point up important parts of the text. 1952. 5th ed., 232 p., 902 illus., glossary, 8½ x 11¼, cloth, $4.75.

HOW TO MAKE YOUR OWN FURNITURE. 1951. 188 p., 240 illus., 8 x 10¾, cloth, $3.95.

RICHEY'S REFERENCE HANDBOOK. 1951. 1,640 p., 540 illus., 431 tables, 4 x 6⅝, fabrikoid, $9.95.

HOME BUILDING AND REPAIR SHORT CUTS. 1952. 201 p., 1,126 illus., 8½ x 11, cloth, $4.50.

HOW TO EXPAND AND IMPROVE YOUR HOME. 1951. 256 p., 1,225 illus., 8 x 10¾, cloth, $5.95.

EDUCATIONAL DISCOUNTS: 1 to 9 copies of a title — 15%, 10 to 24 — 20%, 25 to 99 — 25%, 100 or more — 30%. Free desk copy with orders of 10 or more.

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Send me for 30 days examination the books checked below. I will either return them and owe nothing, or keep them and remit their price less 15% educational discount.

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- ☐ House Construction Details, $4.95
- ☐ House Carpentry and Joinery, $4.75
- ☐ How to Make Your Own Furniture, $3.95
- ☐ Richey's Reference Handbook, $9.95
- ☐ Home Building & Repair Short Cuts, $4.50
- ☐ How to Expand & Improve Your Home, $5.95

Name.....
School.....
Street.....
City, State.....

SHOP EQUIPMENT NEWS

(Continued from previous page)

This material is marketed under the name of "Sure Spec Tinker Pak" and consists of an assortment of carbon and alloy steels, in bars from 3/16 to 1/2 in. diameter; flats from 1/8 by 5/16 to 1/4 by 1/2 in.; and seamless tubing from 1/4 to 1 5/8 in. O.D. It is obtainable in two sizes. The Tinker Pak consists of 12 pieces each approximately 12 in. long. The Super Tinker Pak consists of 12 pieces, each of which is 36 in. long.

For further information write to *Solar Steel Corp., Union Commerce Bldg., Cleveland, Ohio.*

For brief reference use IAVE — 0110.

SCREW EXTRACTORS ADDED TO WILLIAMS LINE

Williams announces the addition of Screw Extractors to their expanding line of tools. They are ideal for quick, easy removal of broken screws, bolts, studs, or other threaded forms without injury to the tapped threads. Williams Screw Extractors are used in industrial plants, machine shops, garages, ship yards, railway shops, school and home workshops, and the like.

Available in nine sizes, individually packaged in cardboard envelopes and in sets complete with maple block stand.

For further information write to *J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.*

For brief reference use IAVE — 0111.

SPACE SAVING RECORD STORAGE

Equipto, division of Aurora Equipment Company, announces new accessible space saving steel storage files for old records. They are compact, and permit use of "sky room" area, thus making use of waste upper space and conserving valuable floor area. Aisle space need only be 24 in. wide.

Old records are usually saved for five years or more, which means that at least five times the file capacity is needed for them than for current records. Equipto old record files permit these records to be kept in minimum space.

Steel Storage Files

The records go directly from current files onto shelves in chronological, alphabetical, or numerical order. Label holders permit instant location and easy access as there are no cumbersome boxes or drawers to pull out. The units are equipped with front bases and finished in olive green baked-on enamel. They are 3 ft. wide, 7 or 10 ft. high, and they permit of a large choice of depths. Shelves adjust vertically on 1½-in. centers to accommodate various size files.

A fully illustrated 24-page catalog, No. 473, may be obtained by writing to *Aurora Equipment Co., Aurora, Ill.*

For brief reference use IAVE — 0112.

NEW CATALOG ON CINCINNATI TRAY-TOP ENGINE, TOOLROOM AND GAP BED LATHES

A new fully-illustrated 24-page Catalog No. t-101 on light-duty Tray-Top lathes, covering engine, toolroom, and gap bed models, has just been published by Cincinnati Lathe and Tool Company. Unusually detailed in content, the catalog presents complete specifications, descriptions of design and construction features, and tables of available threads and feeds.

Such important features as quick conversion from English to metric thread chasing are fully described and step-by-step conversion procedure is given. The catalog also presents the full line of Tray-Top Lathe accessories and condensed data on the Standard Lathes and Canedy-Otto-Cincinnati drilling machines, manufactured by the *Cincinnati Lathe and Tool Co., Cincinnati 9, Ohio.*

For brief reference use IAVE — 0113.

(Continued on page 35A)

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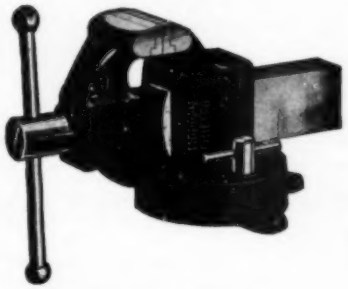

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CRAFTSMAN SUPPLY HOUSE
SCOTTSVILLE, N.Y

SHOP EQUIPMENT NEWS

(Continued from page 34A)

A NEW DI-ACRO CATALOG

A new 32-page catalog describing how Di-Acro metalworking machines perform a wide variety of forming, cutting, and punching operations in medium and lightweight materials has just been published by the O'Neil-Irwin Mfg. Company.

A feature of the catalog is the arrangement of machine specifications and material forming capacities into tabular form for quick, ready reference.

There also are case histories of how numerous companies are applying "Die-less Duplicating" techniques to their particular problems.

Seven basic Di-Acro Machines — benders, brakes, notchers, punch presses, rod parters, rollers, and shears — are available in 36 sizes.

Twenty-six of these machines are hand operated; the ten power models are for use where long production runs and operator fatigue are considerations.

Order your copy from *O'Neil-Irwin Mfg. Co., 544 Eighth Ave., Lake City, Minn.*

For brief reference use IAVE – 0114.

THE LIMA ELECTRIC MOTOR COMPANY CATALOG

The Lima Electric Motor Company has recently published an attractive catalog illustrating and describing their motors and gearshift drives that have been found as useful in the shops at school as in industry.

Besides motors and gearshift drives, the catalog also describes a new 6-in. Model *A* Lima De Luxe Utility Grinder, which has die-cast, dynamically balanced rotors, and prelubricated sealed ball bearings. This grinder is powered by a ¼-h.p. motor, and has a cast iron base, rubber mounted and drilled for permanent mounting.

For further information write to *The Lima Electric Motor Co., Lima, Ohio.*

For brief reference use IAVE – 0115.

A NEW PUBLICATION FOR HOME WOODWORKERS

A monthly woodworking information sheet is being offered. free of charge, by DeWalt, Inc., manufacturers of power cutting tools. The name of the bulletin is "Make It Yourself," and though addressed primarily to home users of the DeWalt Power Shop, it will carry items of detailed woodworking information which will be of interest to all persons engaged in all phases of woodworking.

Free copies of this informative bulletin may be obtained by contacting your local DeWalt Dealer, or by writing direct to *DeWalt, Inc., Lancaster, Pa.* Ask to be placed on the Make It Yourself mailing list.

For brief reference use IAVE – 0116.

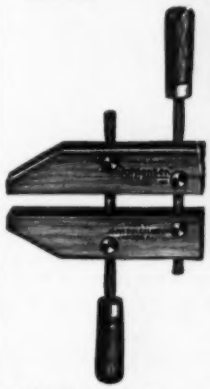
NEW LITERATURE ON CONTOUR-MATIC BANDMACHINING

A new 16-page brochure covering the Contour-matic, hydraulically operated bandtooled machine, is announced by the DoAll Company. The booklet may be obtained by request to any DoAll store or representative.

This brochure explains bandmachining, describes the features of the Contour-matic in detail, and illustrates its use on many industrial applications. Included are illustrations of the types of bandtools designed especially for this machine. These tools, plus the machine's wide speed range, hydraulic table feed, and coolant system make

(Continued on next page)

SPECIFY AND INSIST UPON GENUINE TRADE MARK Jorgensen REG U S PAT OFF



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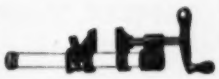
Jaws are clear, straight grain hard maple, properly seasoned and manufactured in our own shop. Cold-drawn steel spindles. Hard maple handles that will not come loose. All parts carefully fitted for smooth, trouble-free operation.

The "JORGENSEN" trade-mark stamped into every jaw is your guarantee — look for it on the Handscrews you requisition.

"PONY" Clamp Fixtures make ideal bar clamps on any length ¾" or ½" black pipe, and will be found to be one of the handiest tools in the shop! Insist on "PONY."



"Jorgensen" and "Pony"

Handscrews, Steel Bar Clamps, Clamp Fixtures, "C" Clamps, Lathe Dogs, etc., are available thru your favorite tool supplier—cost no more than ordinary clamps.

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ELECTRIC PORTABLE OVEN

For preheating Methyl Methacrylate in sheet or rod form where it is necessary to maintain oven temperature throughout the sheet, especially desirable in compressed air, vacuum or pressure forming techniques.

No. 600

The Oven is controlled by a newly developed thermostatic control, sealed in and conveniently placed on the front panel, of the Oven. It can accurately be set at any desired temperature where a quick rate of heat up to 306° F. is desirable.

Due to the Aluminum Construction, the Oven is very light in weight and can be carried from room or project to project. As it operates on 110 volt AC or DC, it can be plugged into any 110 volt receptacle.

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SHOP EQUIPMENT NEWS

(Continued from previous page)

it possible to work with materials heretofore nonmachinable. Attachments are also shown that adapt the machine to specific production jobs.

This booklet is a useful reference. It covers conventional sawing, high speed sawing, friction cutting, bandfiling and polishing, vertical line grinding and diamond sawing.

Write for a copy of this brochure by addressing the *DoAll Co., Des Plaines, Ill.*

For brief reference use IAVE – 0117.

WALKER-TURNER INSTRUCTIONAL RELEASES

Recently released instructional materials from the Walker-Turner Division of the Kearney and Trecker Corporation, are: "Use of the Grinder," "Use of the Band Saw," "Use of the Drill Press," and the Walker-Turner Student Plan Sheets.

These sheets will be found exceedingly helpful. They can be obtained from the *Education Dept., Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J.*

For brief reference use IAVE – 0118.

TUMICO KING-WAY ALIGNMENT INSTRUMENT

A circular has just been released by George Scherr Co., Inc., which describes a new instrument for rebuilding, rescraping, and realigning machine tools.

This instrument was designed by a man who found in his daily work that the ordinary method of placing levels on the beds, across the various V-shaped and flat ways, is insufficient to detect and correct inaccuracies that produce costly production errors.

For descriptive matter on this instrument write to *George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.*

For brief reference use IAVE – 0119.

BOOKLET ON MICROMETER READING

The Lufkin Rule Company has published recently a little booklet titled "Micrometer Reading Made Easy."

This little text combines humorous sketches and down-to-earth instructions to help the beginner acquire the know-how needed to read the micrometer quickly and efficiently.

The booklet also contains a number of useful rules and tables.

A copy of "Micrometer Reading Made Easy" may be obtained by writing to *The Lufkin Rule Co., Saginaw, Mich.*

For brief reference use IAVE – 0120.

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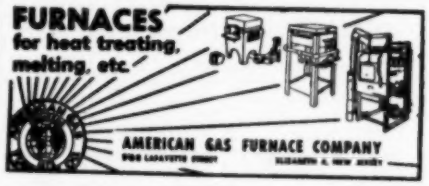

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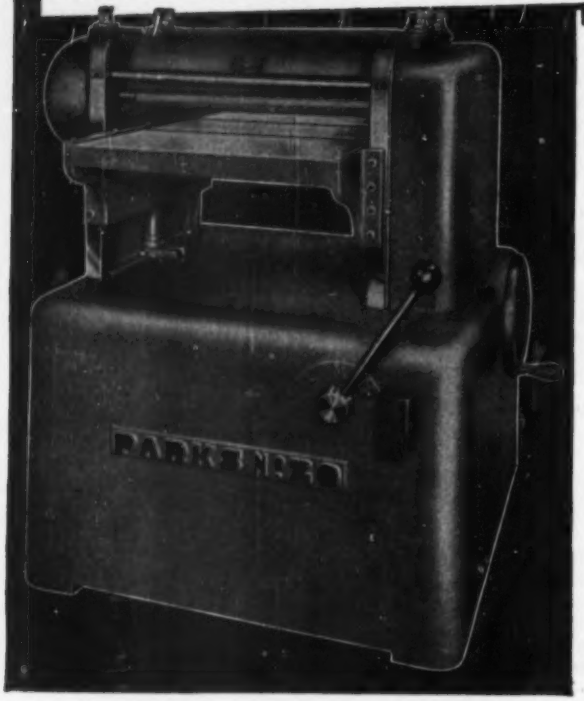

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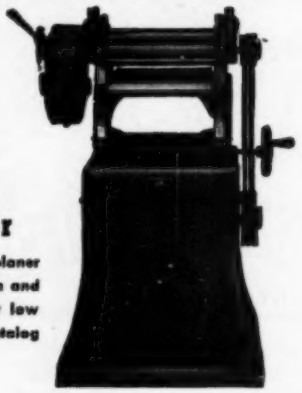

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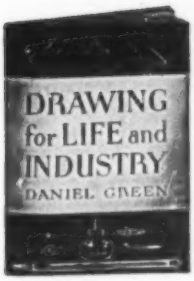

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